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TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1891.

No. 220.

ISAAC N. TOPLIFF, APPELLANT,

vs.

JOHN A. TOPLIFF AND GEORGE H. ELY.

FILED OCTOBER 13, 1888.

No. 277.

JOHN A. TOPLIFF AND GEORGE H. ELY, APPELLANTS

vs.

ISAAC N. TOPLIFF.

FILED OCTOBER 22, 1888.

APPEALS FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE NORTHERN DISTRICT OF OHIO.

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1 Pleas in the circuit court of the United States for the northern district of Ohio, held at the United States court-rooms in the city of Cleveland, in the district aforesaid, before the judges thereof, on the 17th day of May, in the April term of said court, in the year of our Lord one thousand eight hundred and eighty-eight, and of our Independence the one hundred and twelfth year.

AUGUSTUS J. RICKS, *Clerk.*

2 Be it remembered that on the 9th day of June, 1884, there was filed in the clerk's office the following bill of complaint, to wit:

Circuit Court of the United States, Northern District of Ohio, Eastern Division.

To the honorable judges of the circuit court for said division and district:

John A. Topliff and George H. Ely, of Elyria, Ohio, who are citizens of the said northern district of Ohio, bring this their bill against Isaac N. Topliff, of Cleveland, Ohio, who is a citizen of said district; and thereupon your orators complain and say, on information and belief, that one John B. Auger, of Poughkeepsie, in the State of New York, before and at the time of his application for the hereinafter-mentioned letters patent was the true, original, and first inventor of a certain new and useful improvement in gearing for wagons, fully described in the specifications of the letters patent hereinafter mentioned, and which was not known or used in this country before his invention thereof, and was not in public use or on sale with his consent or allowance more than two years prior to his application for said letters patent.

And your orators further show on information and belief that on the 11th day of October, 1870, letters patent for said invention, in due form of law, numbered 108,085, were on his application issued and delivered to the said John B. Auger in the name of the

3 United States of America and under the seal of the Patent Office of the United States, and were signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, and that said letters patent did grant to the said John B. Auger, his heirs and assigns, for the term of seventeen years, the exclusive right to make, use, and vend his said invention throughout the United States and the territories thereof; and your orators bring here into court a copy of said letters patent, and pray that the same may be taken as a part of this bill.

And your orators further show that by virtue of an assignment in writing by the said John B. Auger on or about the tenth day of February, 1873, to one Charles Atwater the entire right, title, and interest in and to the said patent and invention was and became vested in the said Charles Atwater.

And your orators further show that by virtue of an assignment in writing by the said Charles Atwater to one Cyrus W. Saladee on

or about April 9th, 1883, the entire right, title, and interest in and to the said patent and invention was and became vested in the said Cyrus W. Saladee, and said assignment by its terms conveyed to said Cyrus W. Saladee all claims for damages and profits accrued or to accrue by reason of infringements on said patent and for profits made by infringements thereon.

And your orators further show that by virtue of the assignment in writing by the said Cyrus W. Saladee on or about the 9th day of April, 1884, to your orators the entire right, title, and interest in and to said patent and invention was and is now vested in your orators, and said assignment by its terms conveyed to your orators
4 all claims for damage sustained by said Saladee and his assignors by reason of infringements on said letters patent and for all profits made by infringements thereon; which said several assignments were duly recorded in the United States Patent Office, as by said assignments or duly authenticated copies and the certificates of such recording thereto affixed, ready in court to be produced, will more fully show and which your orators pray may be taken as a part of this bill.

And your orators further show that by reason of the aforesaid letters patent and said assignments they became and ever since have been and now are entitled to and possessed of the exclusive right and liberty of making, constructing, using, and vending to others to be used the aforesaid improvement within and throughout the United States and its territories.

And your orators further show, on information and belief, that on or before the 20th day of February, 1872, one Cyrus W. Saladee, of St. Catharine's, Canada, was the true and original and first inventor of a certain new and useful improvement in carriage springs and mode of attachment, fully described in the specifications in the letters patent hereinafter mentioned, and which was not known or used in this country and was not in public use or on sale with his consent and allowance more than two years prior to his application for letters patent of the United States therefor.

And your orators further show, on information and belief, that on the 20th day of February, 1872, letters patent for said invention in due form of law numbered 123,937 were on the applica-
5 tion of said Cyrus W. Saladee issued and delivered to him in the name of the United States of America and under the seal of the Patent Office of the United States and were signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, and that said letters patent did grant to the said Cyrus W. Saladee, his heirs and assigns, for the term of 17 years the exclusive right to make, use, and vend the said invention throughout the United States and its territories.

And your orators further show that by virtue of the assignment in writing by the said Cyrus W. Saladee to your orators on or about the 17th day of February, 1883, the entire right, title, and interest in and to said last-mentioned letters patent and invention was and is now vested in your orators, and said assignment by its terms conveyed to your orators all claims for damages sustained by him,

the said Saladee, by reason of the infringements of his said letters patent and for profits made by infringers thereon, which said assignment was duly recorded in the United States Patent Office, as by said assignment or by duly authenticated copy thereof and the certificate of such recording thereto affixed, ready in court to be produced, will more fully appear, and which they pray may be taken as a part of this bill.

And your orators further show that by reason of the aforesaid letters patent and assignment they became and ever since have been and now are entitled to and possessed of the exclusive right and liberty of making, constructing, using, and vending to others
6 to be used the aforesaid improvement within and throughout the United States and its territories.

And your orators further say that they, the said John A. Topliff and George H. Ely, of Elyria, Ohio, before and at the time of their application for the hereinafter-mentioned letters patent were the true, original, and first inventors of a certain new and useful improvement in connecting carriage springs, which was not known or used in this country and was not in public use and on sale with their consent or allowance for more than two years prior to their application for letters patent.

And your orators further show that on the 19th day of December, 1871, letters patent for said invention in due form of law, numbered 122,079, were on their application issued and delivered to the said John A. Topliff and George H. Ely in the name of the United States of America and under the seal of the Patent Office of the United States, and were signed by the Secretary of the Interior and countersigned by the Commissioner of Patents, and the said letters patent did grant to the said John A. Topliff and George H. Ely, their heirs and assigns, for the term of 17 years, the exclusive right to make, use, and vend the said invention throughout the United States and its territories.

And your orators further show that said letters patent were inoperative by reason of a defective and insufficient specification, and that the error arose from inadvertence and without any fraudulent or deceptive intention, and that John A. Topliff and George H. Ely thereupon duly surrendered said letters patent, whereupon
7 the Commissioner of Patents, on the 9th day of February, 1872, caused new letters patent, numbered reissue 4857, for the same invention and in accordance with a corrected specification, to be issued to the said John A. Topliff and George H. Ely for the unexpired part of the term for said original letters patent.

And your orators further show on information and belief that said reissued letters patent were inoperative by reason of a defective and insufficient specification, and that the error arose from inadvertence and without any fraudulent or deceptive intention, and that the said John A. Topliff and George H. Ely thereupon duly surrendered the said last-named reissued letters patent; whereupon the Commissioner of Patents, on the 28th day of March, 1876, caused new letters patent numbered reissue 7017, for the same invention and in accordance with a corrected specification, to be issued to the said John A. Topliff and

George H. Ely for the unexpired part of the term of said last-named reissued letters patent, as by said last-mentioned reissued letters patent or a duly authenticated copy thereof, in court to be produced, will appear.

And your orators further show that by reason of the aforesaid letters patent and reissued letters patent they became and ever since have been and now are entitled to and possessed of the exclusive right of making, constructing, using, and vending to others to be used the aforesaid improvement within and throughout the United States and its territories.

And your orators further show that they have been in the constant, exclusive, and undisputed use and possession of said
8 several improvements or inventions described in and secured by the said several letters patent and reissued letters patent since the issuing of the same or the making of the assignments as hereinbefore set forth and have been ever since the issuing of the same or the making of the said assignments and are now the sole and exclusive owners of said letters patent and reissued letters patent and the improvements and inventions therein described and secured, and that the same are susceptible of conjoint use.

And your orators further show that since the issuing of said several letters patent and reissued letters patent and the making of said assignments they, as partners under the style of Topliff and Ely, have invested and expended large sums of money and have been to great trouble and expense for and about said inventions for the purpose of carrying on the business of manufacturing and selling the same and making the same profitable to themselves and useful to the public, and that said inventions have been and are of great value and utility to the public, and have been and are manufactured and sold by your orators to the great benefit and profit of your orators and the public, and that the public have acknowledged the rights of your orators under said patents and assignments and have generally acquiesced in the same, but with the exception hereinafter stated of the infringements by said defendant, and that your orators will still realize due gains and profits from said improvements if further infringements of said letters patent by said defendant be restrained.

And your orators upon information and belief further show and
9 allege the fact to be that the said defendant, well knowing the premises and the rights granted by and secured to your orators as aforesaid, but contriving to injure your orators and deprive them of the benefits and advantages which might and otherwise would accrue unto them from said inventions as aforesaid, without the license of your orators and against their will and in violation of their rights as aforesaid since the granting of the said reissued letters patent and since said patent was granted to the said Saladee and since said patent was granted to said Auger and since and before the making of said assignments has made and used, offered for sale, and sold to others to be used said inventions and improvements and is now continuing to make and sell said improvements within said northern district of Ohio and elsewhere in the United States and has threatened and is threatening to make, use,

and sell said improvements in carriage springs and attachments containing said improvements to others throughout the district aforesaid and the United States.

And your orators have reason to believe that the said defendant will continue to make, use, and sell the same, although heretofore notified by complainants to desist therefrom, and refuse to your orators any of the profits which he has made by said unlawful manufacture, use, or sale, and will not desist from making, using, and selling the same in violation and infringement of the rights of your orators, secured to them as aforesaid, and against their consent and allowance; all of which acts are in violation of the exclusive rights and privileges so as aforesaid vested in your orators by virtue
10 of said letters patent and reissued letters patent and assignments and are contrary to equity and good conscience and tend to the manifest and irreparable injury of your orators in the premises.

Wherefore and forasmuch as your orators can have no adequate relief, except in this honorable court, to the end that said defendant may, if he can, show why your orators should not have the relief hereby prayed for and may, upon his corporal oath and according to his best knowledge, information, and belief, full, true, direct, and perfect answer make to the premises and may be compelled to account for and pay to your orators the amounts and profits by him accrued from the manufacture and sale as aforesaid and the damages suffered by your orators from the aforesaid unlawful acts of the defendant and be restrained from any other further violation of the rights of your orators, your orators pray that your honors may grant the writ of injunction, issuing out of and under the seal of your honorable court, and to grant like preliminary injunction, to be in force until the final hearing of this cause, enjoining and restraining the said defendant, his servants, agents, attorneys, and workmen and each and all of them, from directly or indirectly making, constructing, using, vending, delivering, or working or putting or continuing in practice, operation, or use or in any way counterfeiting or imitating the said inventions or improvements or any part thereof, and that the said defendant may be compelled to account for and pay over to your orators all the profits which the defendant has derived or shall have derived from any
11 making or using or vending to others to be used any of the said improvements or any part of them, and also that the defendant be decreed to pay all the damages which your orators have incurred or shall have incurred on account of the defendant's said infringements of the said letters patent so as aforesaid assigned to him and the said reissued letters patent, and also that the said defendant be decreed to pay the costs of this suit, and that your orators may have such other and further relief as the equity of the case or the statutes of the United States may require and to this court may seem just; and may it please your honors to also grant unto your orators a writ of subpœna, to be issued in this cause out of and under the seal of this honorable court, directed to the said defendant, Isaac N. Topliff, commanding him by a certain day named therein to be and appear in this honorable court, then and

there to answer the premises and to abide by and perform such order and decree as may be made against him, and your orators will ever pray.

JOHN A. TOPLIFF AND
GEORGE H. ELY,
By SHERMAN & HOYT,
Their Solicitors.

SHERMAN & HOYT,
Solicitors for Complainants.

12 NORTHERN DISTRICT OF OHIO, *ss:*

On this 31st day of May, A. D. 1884, before me personally appeared George H. Ely, one of the complainants in the above-entitled cause, who, being by me first duly sworn, deposes and says that he has read the foregoing bill of complaint by him and John A. Topliff subscribed, and that the same is true of his own knowledge. As to matters which are therein stated to be based on information and belief, *and* that as to those matters he believes it to be true.

GEO. H. ELY.

Sworn to before me and subscribed in my presence by the said Geo. H. Ely this 31st day of May, 1884.

[SEAL.] FRED. N. SMITH,
Notary Public.

Endorsed: U. S. circuit court, northern dist. Ohio. John A. Topliff *et al. vs.* Isaac N. Topliff. Bill in chancery. Filed Jun. 9, 1884. A. J. Ricks, clerk U. S. circuit court. Sherman & Hoyt, compl'ts' sol's.

13 And afterwards the following subpœna was issued in said cause, to wit:

THE UNITED STATES OF AMERICA, } *ss:*
Northern District of Ohio, }

The President of the United States of America to the marshal of the northern district of Ohio, Greeting:

You are hereby commanded to summon Isaac N. Topliff if he, may be found in your district, to be and appear in the circuit court of the United States for the northern district of Ohio aforesaid, at Cleveland, on the first Monday in August next, to answer a certain bill in chancery filed and exhibited in said court against him by John A. Topliff and George H. Ely.

Hereof he is not to fail under the penalty of the law thence ensuing, and have you then and there this writ.

Witness the Honorable Morrison R. Waite, Chief Justice of the United States, this 9th day of June, A. D. 1884, and in the 108th year of the Independence of the United States of America.

A. J. RICKS, *Clerk,*
By O. C. BEATTY,
Deputy Clerk. [SEAL.]

MEMORANDUM—The said defendant is required to enter his appearance in this suit in the clerk's office of said court on or before the first Monday of July, 1884; otherwise the said bill may be taken *pro confesso*.

A. J. RICKS, *Clerk*,
By O. C. BEATTY,
Deputy Clerk.

Indorsed: No. 4289. United States circuit court, northern district of Ohio. In chancery. John A. Topliff *et al. vs.* Isaac N. Topliff. Subpœna. Returnable July 7th, 1884. Rule day for appearance, July 7th, 1884. Rule day for answer, August 4th, 1884.
14 Returned and filed June 11, 1884. A. J. Ricks, clerk. Sherman & Hoyt, complainants' solicitors.

NORTHERN DISTRICT OF OHIO, *ss*:

On the 10th day of June, 1884, I delivered to the within-named Isaac N. Topliff a true and duly certified copy of this writ at Cleveland, Ohio.

W. F. GOODSPEED,
U. S. Marshal,
By JOHN ODELL, *Deputy*.

Fees:	
Service	$2 00
Copy	50
Travel	50
	$3 00

15 And afterwards, to wit, on the 24th day of July, 1884, the following answer was filed, to wit:

Circuit Court of the United States, Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF and GEORGE H. ELY, Complainants,
vs.
ISAAC N. TOPLIFF, Defendant. } Answer.

This defendant is informed and admits that letters patent of the United States for an alleged improvement in gearing for wagons were issued to John B. Auger Oct. 11, 1870, numbered 108,085, but whether or not the forms of law in such cases made and provided were complied with this defendant does not know and is not informed save by said bill of complaint, and he leaves the complainants to make such proof thereof as they may deem proper.

And defendant, further answering, denies on information and belief that the said letters patent were obtained for any good or lawful cause, but, on the contrary, defendant avers on information and belief that the said alleged invention was publicly known and used for more than two years prior to the date of the application for said

letters patent, and that the said John B. Auger was not the first and original inventor of the matters and things claimed in the letters patent numbered 108,085, cited in said bill of complaint, or of any material or essential part thereof, and that the alleged invention and improvement claimed in said letters patent include mat-
16 ters in which the said John B. Auger neither has nor had any right or title; that the said invention and improvement is claimed by said John B. Auger without good and lawful cause in the said letters patent, which are null and void; that neither the alleged invention nor any material part thereof was new at the time said letters were granted to the said John B. Auger, but that the alleged invention was publicly known and used prior to the alleged invention thereof by the said John B. Auger; and defendant avers on information and belief that all the material and essential parts of the alleged invention claimed and set forth in the aforesaid letters patent by the said John B. Auger were publicly known and used by divers persons and parties in the United States for more than two years previous to the date of the application for the said letters patent referred to in the said bill of complaint as issued to said John B. Auger.

This defendant further says that he has no knowledge whether the said John B. Auger ever executed and delivered any instrument of grant or made any assignment to the said Charles Atwater purporting to convey to him, said Atwater, the entire right, title, and interest in and to the said patent and invention, and he leaves the complainants to make such proof thereof as they may deem proper.

This defendant further says that he has no knowledge that the said Charles Atwater ever executed and delivered any instrument of grant or made any assignment to the said Cyrus W. Saladee purporting to convey to him, said Saladee, the entire right, title, and interest in and to said patent and invention and all claims
17 for damages accrued or to accrue by reason of infringements on said patent, and he leaves the complainants to make such proof thereof as they may deem proper.

The defendant further says that he has no knowledge that the said Cyrus W. Saladee ever executed and delivered any instrument of grant or made any assignment to the complainants purporting to convey to them, said complainants, the entire right, title, and interest in and to said patent and invention and all claims for damages or profits accrued or to accrue by reason of the infringement of said patent, and he leaves the complainants to make such proof thereof as they may deem proper; but whether or not any such assignment or assignments were ever made this defendant alleges that the said John B. Auger was not the first and original inventor of the matters and things claimed in said letters patent cited in said bill of complaint or of any material part thereof, and that said Auger had no right, title, or property in or to said alleged invention and could convey no right to or property in said alleged invention or letters patent by any grant or assignment.

This defendant further admits and is informed that on the 20th day of February, 1872, letters patent for an alleged improvement

in carriage springs and mode of attachment were issued to Cyrus W. Saladee, numbered 123,937, but whether or not the forms of law in such cases made and provided were complied with this defendant does not know and is not informed, save by said bill of complaint, and he leaves the complainants to make such proof as they may deem proper.

18 This defendant, further answering, denies on information and belief that the said letters patent were obtained for any good or lawful cause, but, on the contrary, avers on information and belief that the said alleged invention was publicly known and used for more than two years prior to the date of the application for said letters patent, and that the said Cyrus W. Saladee was not the first and original inventor of the matters and things claimed in the letters patent No. 123,937, cited in the said bill of complaint, or any material or essential part thereof, and that the alleged invention and improvement claimed in said letters patent includes matters in which the said Cyrus W. Saladee neither has nor ever had any right or title, and that the said invention and improvement is claimed by said Cyrus W. Saladee without good and lawful cause in the said letters patent, which are null and void, and that neither the alleged invention nor any part thereof was new at the time said letters patent were granted to the said Cyrus W. Saladee, but that the alleged invention was publicly used and known prior to the alleged invention thereof by the said Cyrus W. Saladee.

And this defendant further avers on information and belief that all the material and essential parts of the alleged invention claimed and set forth in the aforesaid letters patent by the said Cyrus W. Saladee were publicly known and used by divers persons and parties in the United States for more than two years previous to the date of the application for the letters patent referred to in the said bill of complaint as issued to said Cyrus W. Saladee.

This defendant further says that he has no knowledge that the said Cyrus W. Saladee ever executed and delivered any instrument of grant or made any assignment to the complainants

19 purporting to convey to them, said complainants, the entire right, title, and interest in and to the said alleged patent and invention and he leaves the complainants to make such proof thereof as they may deem proper; but whether or not any such assignment was made, this defendant alleges that the said Cyrus W. Saladee was not the first and original inventor of the matters and things claimed in said letters patent cited in said bill of complaint or of any material part thereof, and had no right, title, or property in or to said alleged invention and could convey no right to or property in said alleged invention or letters patent by any assignment.

This defendant, further answering, says that he is informed and he admits that letters patent of the United States for an alleged improvement in connecting carriage springs were issued to John A. Topliff and George H. Ely December 19th, 1871, numbered 122,079, but whether or not the forms of law in such cases made and provided were complied with this defendant does not know and is not

informed save by said bill of complaint, and he leaves the complainants to make such proof thereof as they may deem proper.

And the defendant, further answering, denies that the said letters patent were obtained for any good or lawful cause, but, on the contrary, this defendant avers on information and belief that the said alleged invention was publicly known and used for more than two years prior to the date of the application for said letters patent, and that the said John A. Topliff and George H. Ely were not the first and original inventors of the matters and things claimed in
20 the letters patent cited in the said bill of complaint or of any material of essential part thereof, and that the alleged invention and improvement claimed in said letters patent includes matters in which the complainants have no right or title, and that the said invention and improvement is claimed by the said complainants without good and lawful cause in the said letters patent, which are null and void; and this defendant alleges on information and belief that neither the alleged invention nor any material part thereof was new at the time said letters patent were granted to the said John A. Topliff and George H. Ely, but, on the contrary, avers on information and belief that the alleged invention was publicly known and used prior to the alleged invention thereof by the said complainants.

And this defendant further avers on information and belief that all the material and essential parts of the alleged invention claimed and set forth by the said John A. Topliff and George H. Ely in the aforesaid letters patent were publicly known and used by divers persons and parties in the United States for more than two years previous to the date of the application for the letters patent referred to in the said bill of complaint.

This defendant admits that on the 9th day of April, 1872, said original letters patent No. 122,079 were surrendered, and that new letters patent for the same alleged invention were issued to said John A. Topliff and George H. Ely, numbered reissue 4857, but whether or not the forms of law in such cases made and pro-
21 vided were complied with this defendant — not know and is not informed save by said bill of complaint, and he leaves the complainants to make such proof thereof as they may deem proper.

This defendant admits that on March 28, 1876, said reissued letters patent No. 4857 were surrendered, and that new letters patent for the same alleged invention were issued to said John A. Topliff and George H. Ely, No. 7017, but whether or not the forms of law in such cases made and provided were complied with this defendant does not know and is not informed save by said bill of complaint, and he leaves the complainants to make such proof thereof as they may deem proper.

And this defendant on information and belief avers that said last reissue is for a different invention from that covered by the original patent and is null and void.

This defendant further avers on information and belief that all material and substantial parts of each and all of said alleged inven-

tions referred to in the letters patent cited in said bill of complaint are shown, set forth, and described in the following United States letters patent, bearing date and issued as follows, to wit:

Jones, Eells & Griswold, July 16, 1838, No. 842;
C. C. Stringfellow and D. W. Surles, Jan'y 15, 1861, No. 31134;
C. M. Sexton, August 18, 1868, No. 81217;
A. C. Stowe, November 24, 1868, No. 84316;
A. C. Stowe, December 22, 1868, No. 85144; and
Benjamin Hershey, August 29, 1871, No. 118,452.

And this defendant, further answering, denies on information and belief that the said letters patent No. 122,079, issued December 19, 1871, to said John A. Topliff and George H. Ely were granted for any good or lawful cause. On the contrary, this defendant is informed and believes that it is fully shown by the official records of the United States Patent Office that the application upon which the patent last referred to as issued to John A. Topliff and George H. Ely was granted was rejected on or about the 6th day of November, 1871, for want of novelty, in view of the prior inventions.

22

And this defendant believes, and so charges, that said John A. Topliff and George H. Ely have no valid right or title for, to, or in the alleged inventions described in the letters patent granted to the said John A. Topliff and George H. Ely, nor in the alleged invention described in the letters patent granted to said John B. Auger or to said Cyrus W. Saladee, Nos. 108,085 and 123,937; and, the complainants knowing this, have instituted proceedings to harass this defendant with vexatious suits and proceedings for alleged infringements of said patents, and to enable said complainants, John A. Topliff and George H. Ely, to extort license fees from this defendant for the use of said inventions or to compel him to wholly abandon their use.

This defendant further says that he has no knowledge of the amount of money expended or of the trouble and expense incurred by the complainants in the manufacture and sale of said inventions. Defendant admits that said complainants have manufactured and sold said articles, but to what extent he has no knowledge, and he denies that the public have acknowledged the right of the complainants under said patents and assignments, and that the public have generally acquiesced in complainants' claim to the same.

23

This defendant admits that he has manufactured and sold connecting rods for carriages substantially like those manufactured by the complainants, and he claims the right to continue to manufacture and sell the same, but he denies that the same is a violation and infringement of any rights of the complainants secured to them by said letters patent and assignment or either of them, and he alleges that such manufacture and sale in no way infringes upon any right, title, property, or interest which complainants have in and to said invention.

And this defendant prays that the same benefits of the matters and things herein set forth be granted as if for the reason thereof

the said bill had been demurred to when a demurrer would have been proper, and the same benefits as they would have had in case the same had been pleaded specially in bar of said bill.

And this defendant submits to this honorable court that the said complainants have no right to the said bill of complaint and no right to any injunction, account, or other relief prayed for in the bill aforesaid.

And the defendant further prays to be hence dismissed with his reasonable costs and charges.

Solicitors for Defendant.

24 UNITED STATES OF AMERICA,
Northern District of Ohio, at Cleveland, } ss:
County of Cuyahoga,

On this — day of July before me personally appeared Isaac N. Topliff, the defendant in the above cause, who, being duly sworn, deposes and says that he has read the foregoing answer by his attorneys subscribed and that the same is true of his own knowledge except as to matters as therein stated on belief and information, and as to those matters he believes it to be true.

I. N. TOPLIFF.

Sworn to by Isaac N. Topliff before me and by him in my presence subscribed this 24th day of July, 1884.

[SEAL.] NORTON T. HORR,
Notary Public.

Endorsed: 4289. U. S. circuit court, northern dist. Ohio, E. D. John A. Topliff *et al. vs.* Isaac N. Topliff. Answer. Filed Jul. 24, 1884. A. J. Ricks, clerk U. S. circuit court. Boynton & Hale, defendant's solicitor.

25 And afterwards, to wit, on the 29th day of September, A. D. 1884, there was filed in this cause a deposition on behalf of the complainant; which said deposition is in the words and figures following, to wit:

Deposition taken before me, A. C. Dustin, a notary public duly commissioned within and for the county of Cuyahoga and State of Ohio, to be used on behalf of complainants in a case now pending in the United States circuit court for the northern district of Ohio, wherein John A. Topliff and George H. Ely are complainants and Isaac N. Topliff is respondent, pursuant to the agreement of counsel.

Present on behalf of complainants: Henry S. Sherman, Esq.
Present on behalf of respondent: Hon. J. C. Hale.

The complainants offer in evidence—

1st. The model of the improvement in connecting springs of vehicles, marked "Complainants' Exhibit A," which model is offered

for the purpose of showing the side springs of the vehicle connected with the front and rear ends of the wagon gearing, so as to equalize the action of said springs and cause them to move in unison with each other. Said model is offered also as a model of the improvement made and sold by complainants and covered by the letters patent in complainants' bill mentioned.

Respondent objects to the statements of counsel as to the purposes for which model is offered.

Complainants offer in evidence a certified copy of letters patent of John B. Auger, marked "Complainants' Exhibit B," and dated October 11th, 1870, and numbered 108,085.

26 Also a certified copy of assignment of said letters patent by John B. Auger to Charles Atwater, marked "Complainants' Exhibit C," which assignment bears date February 4th, 1873.

Also a certified copy of the assignment of said letters patent by Charles Atwater to Cyrus W. Saladee, marked "Complainants' Exhibit D," which assignment bears date April 9th, 1883.

Also a certified copy of the assignment of said letters patent by Cyrus W. Saladee to the complainants, marked "Complainants' Exhibit E," which assignment bears date April 9th, 1884.

Also a certified copy of the letters patent granted to Cyrus W. Saladee, marked "Complainants' Exhibit F," which letters patent are dated February 20th, 1872, and numbered 123,937.

Also a certified copy of the assignement of said last-named letters patent, marked "Complainants' Exhibit G," executed by said Cyrus W. Saladee to the complainants, and dated February 9th, 1883.

Also a certified copy of the letters patent granted to the complainants, Topliff and Ely, marked "Complainants' Exhibit H," which letters patent bear date December, 1871, and are numbered 122,079.

And also a certified copy of the reissue letters patent granted to the complainants, Topliff and Ely, marked "Complainants' Exhibit I," which reissue letters patent bear date April 9th, 1872, and are numbered 4857.

Also a certified copy of reissue letters patent granted to the complainants, Topliff and Ely, marked "Complainants' Ex-

27 hibit K," which reissue letters patent bear date March 28th, 1876, and are numbered 7017.

Also a model of the improvement in connecting springs, constructed with cast or malleable iron hubs, having arms formed upon and as a part of same, into which the ends of a rod are inserted and rigidly held, as shown in the model, which model is marked "Complainants' Exhibit L" and made a part of this deposition and filed with the deposition and attached to it.

GEORGE H. ELY, of lawful age, being first duly sworn, as hereinafter certified, on behalf of complainants, deposes and says as follows:

(By HENRY S. SHERMAN, Esq.:)

Q. State your name, residence, and occupation.

A. Name, George H. Ely; residence, Elyria, Ohio; occupation, manufacturer of carriage hardware.

Q. You are one of the complainants named in the bill?

A. Yes, sir.

Q. And a partner of John A. Topliff, the other complainant?

A. Yes, sir.

Q. Please look at the model "Complainants' Exhibit A" and state what it is.

A. It is a model of the gearing of a buggy, containing the connecting rods. The parts made by us are the two rods connecting the ends of the two side springs, front and rear ends.

Q. Look at model "Complainants' Exhibit A" and state whether the connecting rods shown in that model are substantially
28 similar to or unlike the connecting rods you are now and have been manufacturing.

A. They are similar to and like the ones we are and have been making.

GEO. H. ELY.

Stipulation.

It is hereby stipulated by and between the complainants and respondent in this action that, prior to the filing of complainants' bill herein and subsequent to the year 1880, the respondent, Isaac N. Topliff, at Cleveland, Ohio, did manufacture and sell certain connecting rods to equalize the action of the side springs of a vehicle, causing them thereby to move in unison with each other, which said connecting rods so made and sold by respondent were constructed substantially like the model "Complainants' Exhibit A" hereinbefore offered in evidence, and that said respondent did make and sell, prior to January 1st, 1883, and subsequent to January 1st, 1882, other connecting rods which were constructed with cast hubs, having arms formed upon said hubs as a part of the same, into which the ends of a rod were inserted and rigidly held, substantially like the model, as shown in "Complainants' Exhibit L" hereinbefore offered in evidence.

30 UNITED STATES PATENT OFFICE.

JOHN B. AUGUR, of Poughkeepsie, New York.

Improvement in Gearing for Wagons.

Specification forming part of Letters Patent No. 108,085, dated October 11, 1870.

To all whom it may concern:

Be it known that I, John B. Augur, of Poughkeepsie, in the county of Dutchess and State of New York, have invented certain improvements in gearing for buggies and other vehicles; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is

J. B. AUGER.

Wagon Gearing.

No. 108,085. Patented Oct. 11, 1870.

Nos. 220 + 274. Tapliff " Tapliff et al. } p. 29.

Fig. 4.

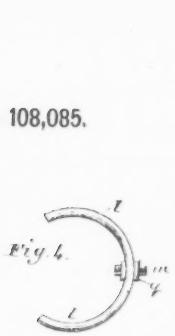


Fig. 1.

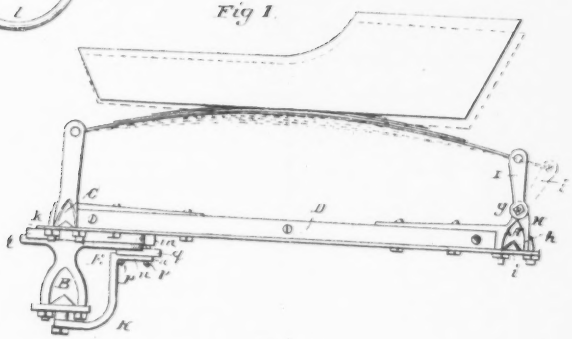


Fig. 2.

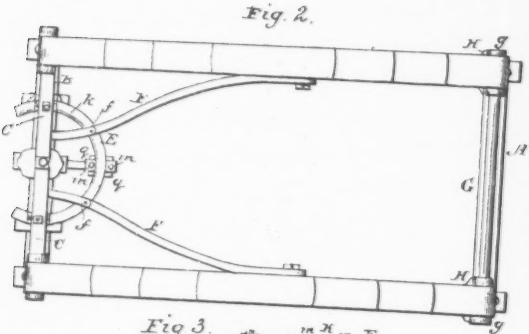
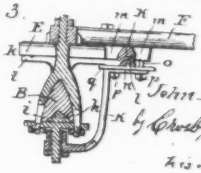


Fig. 3.



Witnesses:
H. P. Ketchum
W. A. Peake

Inventor:
John B. Auger
by Crosby, Halstead & Gould
his Attorneys

a description of my invention sufficient to enable those skilled in the art to practice it.

My present invention is for improvements upon the buggy-gearing patented to me in patent No. 102,905, dated May 10, 1870, and antedated January 13, 1870.

My improvements consist, first, in connecting together by a rigid rod the two pivoted links upon the clips employed on the hind axle, so that when the weight is upon one spring, both springs, by reason of the connecting-rod, shall be caused to work together, thus preventing the roll; also, in constructing the steel axle with an inverted V-shaped space or cavity lengthwise of the same on its under side, thus materially lightening the axle and saving stock, while leaving the axle in the best form for strength; also, in combining with a fifth-wheel lugs at its middle, which, in conjunction with a lug and bolts upon the brace connecting it with the bolster, serve to compress a rubber pad placed between the bottom of the wheel and the under lug on the brace, and prevent rattling; also, in the employment of braces running from the bolster, and preferably bolted to the fifth-wheel, over which they pass, and firmly secured to the reaches; also, in certain details hereinafter mentioned.

In the drawing—

(Here follows diagram marked p. 29.)

Figure 1 represents a side view of my improvements, the springs being shown in two positions, to show the action of my improved clip connection. Fig. 2 is a top view of my improvements; and Fig. 3, a central vertical transverse section through the front axle, fifth-wheel, and their connections and adjacent parts; and Fig. 4 is a top view or plan of the under "circle" or portion of the fifth-wheel.

A represents the hind axle; B, the front one; and C, the bolster. D D are the reaches connecting the bolster and hind axle; E, the fifth-wheel; F, the braces connecting the bolster and reaches, the point at which the braces are connected to the fifth-wheel being shown at *f*.

The rod which connects together the swinging links on the hind axle is shown at G, the clips being seen at H and the links at I.

The rod G is turned down at each end, to pass through the eyes of the links and through the clips, and is threaded at each extreme end, to receive a nut, *g*. This rod turns in its bearings in the clips, the links having square or equivalent openings in their inner eyes, to receive a correspondingly-shaped portion of the rod. This insures a positive rocking of the rod upon its axis whenever either link is swung forward or back by the action of its own spring, and positively compels (through the agency of the rod) the simultaneous and equal movement, and with positiveness, of both the links, and, as a consequence, an equal action of both springs of the vehicle, even though all the weight may be upon one side. In short, one spring cannot act without forcing the same action upon the other, and hence the weight is brought to bear upon both ends of the

axle. Anything like a roll is prevented, and there is no undue straining or contorting of the springs, axle, or any other parts.

Instead of having the connecting-rod serve also as the axis for the swinging links, it may be made separately and connect the links at a point above their centers of motion. I prefer, however, the construction shown, as it conduces to greater strength and security and certainty of action.

Instead of making the axle flat or square at the bottom, as described in my above-named patent, I form it on its under side as shown at *h* in the drawing—that is, with an arched or V-shaped portion cut away. This dispenses with a large percentage of the weight and cost of the metal, and, inasmuch as the axle is still left of sufficient vertical thickness to withstand all the requirements of an axle and is less clumsy, is found to be a great advantage.

The form given to the cut-away part imparts to the axle the properties and strength of the arch, and it is actually less liable to break, and can better withstand and resist severe shocks than if made without the groove. This groove need not necessarily be
31 made angular in cross-section, but may be in the form of a Gothic or of a true arch, the same general principle existing in either form, and the same advantages flowing therefrom, for the purpose intended.

The space in the groove admits of the insertion, if desired, of a correspondingly-shaped piece or fillet of wood, to form a bed or bottom for the axle, and the same will be, when used, securely held to place against lateral displacement by virtue of its own form. Such a piece or bed is shown at *i* in Fig. 1, and also in Fig. 3, and, by reason of its thickness and shape, will last longer and keep its place better than the flat strips heretofore used, and better preserve its contact with the axle.

The upper part, *k*, of the fifth-wheel, it will be seen by reference to Fig. 3, is made concave upon its under side, and the lower part, *l*, is made in one continuous piece of about the same length as the upper part or circle, and continuously convex on its upper side. Therefore as the front axle turns the one part rides without any break or interruption in the groove of the other. This serves to keep both of them, throughout their whole length, from lateral displacement in any direction, and also, as a consequence, to take away from the king-bolt the stress and strain, and relieve it almost entirely from the jars and jerks to which it is subjected under other known constructions, and from the risk of damage or accident likely to result therefrom, and insures also an equal distribution of the wear throughout the whole of the concave or grooved surface, and causes much less wear than if the convex portion were made in two short segments like brackets, and placed distant from each other on opposite sides of the center of the bolster, as has been heretofore practiced. By my construction also each circle steadies the other, and braces it most effectively, and at the same time I have all the advantage due to the prevention of any accumulation of dust between the circles, as it must drop away by its own gravity, because of the double inclined or arch form of the upper side of the lower

circle, which prevents any dirt or dust from remaining thereon. Lugs *m* upon the upper part, *k*, at its center, are connected with a similar lug, *n*, upon the piece or bracket K, which extends from beneath the king-bolt, and bolts and nuts *o p*, as seen, serve to clamp together these lugs and the interposed lower part, *l*, of the fifth-wheel, so as nevertheless to permit the latter to move as may be required.

Between the lower lug, *n*, and the part *l*, I place a rubber (or equivalent) pad, *q*, which, by means of the nuts upon the bolts, may be screwed as tightly as may be found desirable, in order to avoid direct contact of the parts *l* and *n*, and thus prevent their rattling, the same compression which effects this serving at the same time to keep in sufficiently close contact the concave and convex parts of the wheel, which thus cannot rattle.

Rigidly connected with and forming one with the bolster C, I employ two braces, F F, extending therefrom to the reaches D D, to which they are firmly secured, as seen. These braces pass directly across the stationary part of the fifth-wheel, and may be fastened also to it, thus adding to their firmness and efficiency, and each bracing the other. In Fig. 2 the springs conceal the reaches D D, and one only is visible in Fig. 1. The front axle is shown of form similar to the back one, and may, if desired, have a similar wooden bed. The bolster also may be made of similar arched form on its under side, and for the same purpose.

The dotted lines in Fig. 1 show the positions of the buggy body, springs, and pivoted links under the action of any weight, the springs and links on both sides of the carriage descending equally, whether the weight be on one side or not.

I claim—

1. The herein-described method of equalizing the action of springs of vehicles and distributing the weight of the load.

2. The combination of the pivoted links with a rod connecting the same, the rod compelling both links to move in unison, as and for the purpose described.

3. An axle or bolster having its under side cut away or arched, as and for the purposes described.

4. In combination with an axle or bolster having such an under side, a wooden bed, arched or A-shaped on its upper side, to adapt it thereto.

5. A fifth-wheel constructed as shown and described—that is, with a concave under side on its upper part or circle, and with a continuous convex upper side on its lower part or circle, the two having an unbroken or continuous bearing-surface, one upon the other, and operating together, as and for the purpose set forth.

6. The combination, with a fifth-wheel, of the lugs *m m* and *n*, connecting-bolts, and rubber pad or its equivalent, as and for the purpose set forth.

7. The combination of the bracket K and its lug with the fifth-wheel and its lugs *m m*, bolts, nuts, and rubber pad or its equivalent, substantially as shown and described.

8. The combination, with the bolster and reaches D D, of the braces F F, as and for the purpose set forth.

JOHN B. AUGUR.

Witnesses:
W. B. PLACE.
J. J. WARNER.

32 COMPLAINANTS' EXHIBIT C. A. C. Dustin, Notary Pub.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of an instrument of writing executed by J. B. Augur February 4, 1873, recorded in Liber K 16, page 283. Said record has been carefully compared with the original and is a correct transcript thereof.

In testimony whereof I, R. G. Dyrenforth, act'g Commissioner of Patents, have caused the seal of the Patent Office to be affixed this 2d day of June, in the year of our Lord one thousand eight hundred and eighty-four, and of the Independence of the United States the one hundred and eighth.

[SEAL.] R. G. DYRENFORTH,
Act'g Commissioner.

33 Liber K 16, p. 283.

Patent Deed.

Whereas the United States of America did, on the 10th day of May, A. D. 1870, and on the 11th day of October, A. D. 1870, grant letters patent to John B. Augur, now of New Haven, Connecticut, both which said letters patent are for an "improved steel buggy gearing" & are numbered, the first 102,905 and the second 108,085;

And whereas Charles Atwater, of said New Haven, is desirous of acquiring all my interest therein:

Now, this indenture witnesseth: That for and in consideration of the sum of two thousand dollars, to me in hand paid, the receipt of which is hereby acknowledged, I, the said John B. Augur, have assigned, sold, and set over, and do hereby assign, sell, and set over, unto the said Charles Atwater all the right, title, and interest which I have in and to the said invention as secured to me by the said letters patent or as may be secured to me by any reissue of the said letters patent which may be legally obtained for any remainder or residue of the term for which the said letters patent were originally granted for, to, and in all parts of the United States of America and in no other place or places; the same to be held and enjoyed by the said Charles Atwater and his legal representatives for his and their own use and behoof to the full end of the said term so fully and entirely as the same would have been held and enjoyed by — had this assignment and sale not been made.

In testimony whereof — have hereunto set my hand and seal this fourth day of Feb., in the year of our Lord one thousand eight hundred and seventy-three.

J. B. AUGUR. [SEAL.]

Witnesses:
B. E. BROWN.
JOSEPH HOLLIWELL.

34 Recorded Feb. 10, 1873. Ex'd: E. A. M.; H. M. H.

The condition of this assignment is such that whereas I am justly indebted to the said Atwater in the sum of two thousand dollars, as endorsed by my promissory note for that sum, payable one year from its date, to the order of said Atwater, and bearing date the fourth day of Feb., A. D. 1873, with interest at the rate of twelve per cent. per annum: Now, if I shall well and truly pay said note and interest according to the terms thereof, then this assignment to be void; otherwise of full force or effect in law.

J. B. AUGUR.

35 COMPLAINANTS' EXHIBIT D. A. C. Dustin, Notary.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of an instrument of writing executed by Charles Atwater April 9th, 1883, recorded in Liber I 29, page 320. Said record has been carefully compared with the original and is a correct transcript thereof.

In witness whereof I, R. G. Dyrenforth, act'g Commissioner of Patents, have caused the seal of the Patent Office to be affixed this 2d day of June, in the year of our Lord one thousand eight hundred and eighty-four, and of the Independence of the United States the one hundred and eighth.

[SEAL.] R. G. DYRENFORTH,
Act'g Commissioner.

36 Liber I 29, p. 320.

Whereas John B. Augur, of Poughkeepsie, in the State of New York, has obtained two several grands of letters patents of the United States for improvements in running gear of vehicles, the same being numbered and dated respectively as follows, to wit: No. 102,905, dated May 10, 1870, and No. 108,085, dated October 11th, 1870;

And whereas, on the 4th day of February, 1873, the said John B. Augur did assign all his right, title, and interest in the before-recited grants of letters patents to Charles Atwater, of New Haven, in the State of Connecticut, as security for the payment of a certain promissory note, payable to the order of said Charles Atwater, in the sum of two thousand dollars, which said assignment was duly re-

corded in the United States Patent Office Feb'ry 10th, 1873, Liber K 16, page 283, and the same is hereby referred to and made a part of these presents;

And whereas Cyrus W. Saladee, of Torrington, in the State of Connecticut, is desirous of acquiring all of the right, title, and interest of the said Charles Atwater in and to the before-recited grants of letters patents and in and to the said note of two thousand dollars, together with all claims and demands for damages and profits, accrued or to accrue, for the part use of said patents or either of them, without license, which he, the said Atwater, has or may have in the same.

Now, therefore, to all *to* whom it may concern, be it known that, for and in consideration of one dollar in lawful money of the United States, to me in hand paid by the said Cyrus W. Saladee, and for other good and valuable considerations from him to me moving, the receipt of which is hereby acknowledged, I, the said
37 Charles Atwater, have sold, assigned, transferred, and set over, and by these presents do sell, assign, transfer, and set over, unto the said Cyrus W. Saladee, — executors, administrators, and assigns, all the right, title, and interest which I have or may have in and to the said before-recited grants of letters patents throughout the United States and territories thereof, and same to be held and enjoyed by the said Cyrus W. Saladee, for his own use and behoof and for the use and behoof of his executors, administrators, and assigns, to the full end of the term for which said before-recited grants of letters patents are issued, together with all claims and demands that I have or may have for damages and profits, accrued or to accrue, for the past use of said improvements and letters patents therefor, without license.

And I hereby covenant with the said Cyrus W. Saladee, — heirs and assigns, that the before-mentioned note for two thousand dollars remains unpaid, principal and interest, and that for the consideration hereinbefore acknowledged I hereby transfer said note to said Saladee without recourse on me; and I further covenant with the said Saladee, — heirs and assigns, that I have full right to sell and transfer said note and the letters patents aforesaid in manner and form as above written, and that the interest hereby conveyed is free from all prior assignment, grant, license, or other encumbrance whatever under, through, or by me.

In testimony whereof I have hereunto set my hand and seal on this the 9th day of April, 1883.

CHAS. ATWATER. [L. S.]

Witness-:
WILLIAM A. LAW.
C. S. QUINTARD.

Recorded April 14th, 1883.
Ex'd: E. A. M.; N. M. H.

38 COMPLAINANTS' EXHIBIT E. A. C. Dustin, Notary.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of an instrument of writing executed by Cyrus W. Saladee April 9, 1884, recorded in Liber J 30, page 459. Said record has been carefully compared with the original and is a correct transcript thereof.

In testimony whereof I, R. G. Dyrenforth, act'g Commissioner of Patents, have caused the seal of the Patent Office to be affixed this 2d day of June, in the year of our Lord one thousand eight hundred and eighty-four, and of the Independence of the United States the one hundred and eighth.

[SEAL.] R. G. DYRENFORTH,
Act'g Commissioner.

39 Liber J 30, p. 459.

To all whom it may concern:

Be it known that whereas John B. Augur, of Poughkeepsie, in the State of New York, did obtain two several grants of letters patents of the United States for improvements in running gear of vehicles, the same being numbered and dated respectively as follows, to wit: No. 102,905, dated May 10, 1870, and No. 108,085, dated October 11th, 1870; and

Whereas, on the 4th day of February, 1873, the said John B. Augur did assign all his right, title, and interest in the before-recited grants of letters patents to Charles Atwater, of New Haven, Connecticut, and the same — duly recorded in the United States Patent Office Feb'y 10, 1873, in Liber K 16, page 283, of Transfers of Patents; and

Whereas, on the 9th day of April, 1883, the said Charles Atwater did assign all his right, title, and interest in said before-recited grants of letters patents to Cyrus W. Saladee, of Torrington, in the State of Connecticut, and the same — duly recorded April 14th, 1883, in Liber I 29, page 320, of Transfers of Patents, in the Patent Office of the United States, at Washington, D. C.; and

Whereas John A. Topliff and George H. Ely, of Elyria, in the State of Ohio, are desirous of securing the sole and exclusive right and ownership in the said before-recited two several grants of letters patent:

Now, therefore, in consideration of five hundred ($500) dollars paid by the said Topliff and Ely to the said Saladee, the receipt whereof is hereby acknowledged, the said Saladee does by
40 these presents sell, transfer, and assign unto the said John A. Topliff and George H. Ely, their executors, administrators, and assigns, all the right, title, and interest which he, the said Sala-

dee, has or may have in said before-recited grants of letters patent in and for the whole of the United States and territories thereof, for the sole use and behoof of the said Topliff and Ely, their heirs and assigns, to the full end of the term for which said patents are issued, together with all claims or demands for the past use of said improvements patented as aforesaid or any of them, without license.

And the said Saladee, for himself, his heirs, assigns, hereby agrees to and does hereby warrant and defend his title to the sole right in both of said before-recited grants of letters patent as against the claims of all and every person or persons whomsoever.

In testimony whereof the said Saladee has hereunto set his hand on this 9th day of April, 1884.

CYRUS W. SALADEE.

Witnesses:
H. S. SHERMAN.
EDWARD W. PHILPOTT.

Recorded Apr. 18, 1884.
Ex'd: H. M. H.; E. A. M.

42

123,937.

UNITED STATES PATENT OFFICE.

CYRUS W. SALADEE, of St. Catharines, Canada.

Improvement in Carriage-Springs and Mode of Attachment.

Specification forming part of Letters Patent No. 123,937, dated February 20, 1872.

Specification.

Be it known that I, Cyrus W. Saladee, of St. Catharines, in the Dominion of Canada, have invented certain improvements in the construction of springs, and their connections for pleasure vehicles, of which the following is a specification embodying my invention:

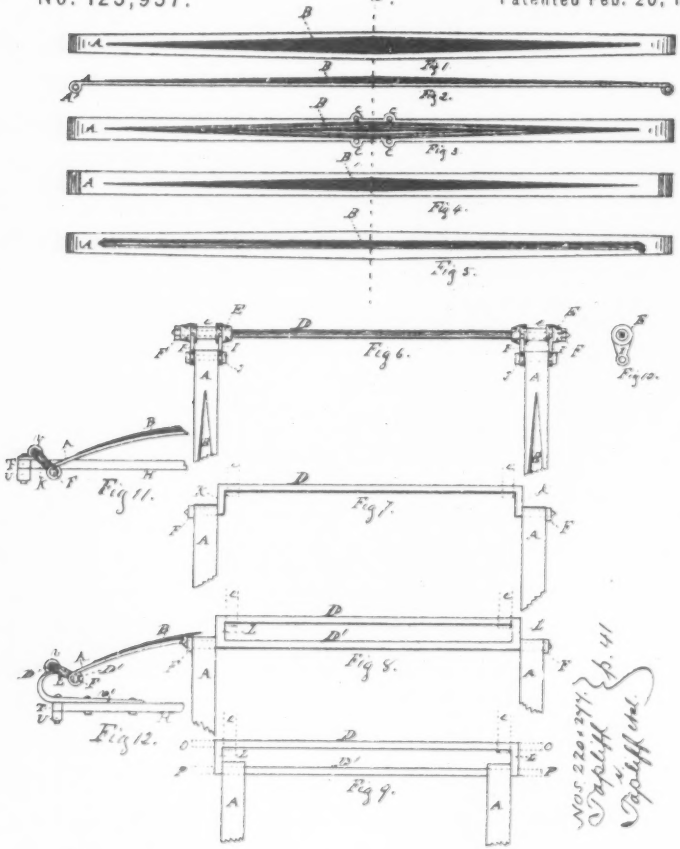
The first part of my invention relates to the formation of side and elliptic springs from one or more plates of steel of uniform thickness, having a corrugation in the center lengthwise the steel, which corrugation tapers both ways from the center between the ends of the plate to the ends of the same. The second part of my invention relates to connecting the outer ends of side springs to a connecting-rod in such manner as to equalize the action of the springs, causing both sides to move in unison with each other, and so as to prevent the body of the vehicle from inclining to one side or the other when the load is all on one side, as when carrying a single passenger. I accomplish this object by several different modifications, as shown by the drawing, and as hereinafter specified.

As regards the first part of my invention, I am not ignorant of the fact that springs, both side and elliptic, have been made from single plates of steel, and strengthened from the ends toward the center by means of corrugations or "ribs" formed thereupon, ex-

C. W. SALADEE. 41

Improvement in Carriage Springs and mode of Attachment.

No. 123,937. Patented Feb. 20, 1872.



Nos 220.274, 123,937 & 124,411

Witnesses.
Wm. Hurley
Edwd. F. Brown

Inventor.
Chas. W. Saladee

tending in part or in whole throughout their entire length; but in every such modification heretofore known or used said corrugations or ribs have been impressed in or upon the steel plate of a uniform width throughout their entire length; so likewise the plates themselves are almost universally made the same width from one end to the other. This principle, however, as applied to a single-plate spring, is wholly at variance with the idea sought to be attained by its application—to wit, a perfect equalization of strain upon every portion of the plate from its cross-center to the ends, as has been fully demonstrated by practical tests, and the use of springs so formed. I propose to attain such perfect equalization of strain upon plates of steel under either of the modifications of my invention hereinafter shown and described.

(Here follows diagram marked p. 41.)

Figure 1 of the drawing is a top view of a side spring whose widest portion is at the center, upon the dotted line S, and gradually tapering on both edges from the center toward each end.

A is the main plate, having rolled or pressed into its under surface a corrugation so formed as to raise a rib or brace, B, upon the opposite or upper surface, said rib having its widest and deepest portion at the center of the plate on dotted line S, and tapering each way on the top and on both edges, to a point at or near the outer ends of the plate A, as clearly shown in Figs. 1 and 2, (Fig. 2 being an edge view of the plate before it is bent.) The plate A, as before intimated, is of uniform thickness throughout, and by being made tapering on the edges from the center to the ends with the corrugation pressed into the plate A, as specified, the latter is so supported at every point from the ends to the center that the strain upon the steel is perfectly equalized throughout the entire length of the plate. In Fig. 3 the plate A is of uniform width and thickness throughout, but having the corrugation and rib B just the same as in Figs. 1 and 2, and having ears C C C C formed solid on the edges of the plate A, which are pierced with holes to receive the ends of the clips passing over the spring-bar. Fig. 4 is a bottom view of a side spring, straight on the edges, and with corrugations, as shown and described in the other three figures. Fig. 5 is a top view of a tapering plate, A, same as Fig. 1, and having a corrugation of uniform width throughout. My purpose is in all cases where I make a corrugation of uniform width to have the plate A tapering on the edges, as seen in Fig. 5, and where it is desirable to have the edges of the plate straight I make the corrugation tapering, as seen by Figs. 3 and 4. But the best form of a spring is made by having both the plate and the corrugation tapering, as seen in Figs. 1 and 2.

It will be understood without particular specification that the formation of the plates shown and described are equally applicable to elliptic springs as to side springs, and I so intend applying and using them.

As regards the second part of my invention, I am well aware that the idea of equalizing the action of springs by means of cross-bars

or "connecting-rods," so applied that their rotating action shall cause both springs to vibrate in unison with each other, or so
43 as to prevent side motion to the body of the vehicle, and so as to distribute the load equally upon the springs, is old and well known. But I propose to accomplish this old and well-known result by a new and improved combination of parts, as shown by the drawing, and as hereinafter specified.

In the drawing, Figs. 6 and 10 represent the first modification of the second part of my invention. Figs. 7 and 11 represent the second modification of the same. Figs. 8 and 12 represent the third modification, and Fig. 9 the fourth modification; and each of the Figs. 6, 7, 8, and 9 may represent both the front and rear connecting-rods with a piece of the ends of the springs in position, while Figs. 11 and 12 are side views of the rear axle, bed-wood, piece of the perch, and spring in position. In Fig. 1, D is the connecting-rod, made of round steel or iron, or of iron or steel tubing. E and E are hubs, upon which are formed, as a part of the same, the short arms I I I I, and the outer ends of which latter are connected to the ends of the springs A, to the front and rear of the gearing of the vehicle, by the passing bolt J. The hubs E are rigidly secured to the ends of the connecting-rod D, either by means of a square hole through their entire length, with a corresponding square upon the ends of the rod to fit therein, and pass through the hub far enough to take the taps F, by which latter they are held firmly in position upon the squared ends of the rod, or in place of taps F rivet a head on the end of the rod; or a round hole may be made into the hub, extending nearly the full length of it, and with a screw-thread cut therein, and with corresponding threads on the ends of the rod D, and the connection will be equally as strong in this manner as in the others above described. When the hub is screwed upon the ends of the rod, as last above described, I am permitted to use a steel or iron tube of requisite diameter, and thus stiffen and lighten this connection. The screw-thread on one end of the tube must be cut "right," and on the other "left," so that the pressure of the ends of the springs between the arms I will tend to tighten the hubs in their position. In the center of the hubs E, between the arms I, are turned the bearings *e e*, by which to connect the tubes, in any one of the well-known modes, to the hind axle and the front bolster of the gearing.

The second modification of my invention is shown by Figs. 7 and 11. The ends of the rod D are bent so as to form the cranks K F, and the ends of the springs are hung and operated upon crank-pin, and there secured by the screw-taps F and F. Dotted lines *e* and *e* represent the point of bearing for the attachment of the rod to the axle or bolster of the vehicle. Fig. 11 is a side view of the rear axle, and showing the usual manner of connecting the rod thereto. In this figure U is an end view of the axle, T the bed-wood, V the bearing in which the rod D rotates, A the rear end of the spring, and H the outside perch broken off.

The third modification of my invention is shown by Figs. 8 and 12.

I will here remark that experience has demonstrated that a positively rigid and perfect equalization of the action of side springs through a single connecting-rod, D, cannot be attained by reason of the vibrating twist or torsion of the rod between its outer bearings. But I propose to meet this difficulty by a suitable combination of twin rods D D′ with the ends of the spring A, as may be seen by both the Figs. 8 and 9. The rod D, Fig. 8, has the ends bent at right angles with the rod, and these turned ends L are welded to rod D′, which latter extends past the ends L far enough to take the ends of the springs A and screw-taps F, as clearly shown by this figure. Fig. 9 is the same combination of twin rods as in Fig. 8, except that both rods are of equal length, and having the ends of the springs connected to the rod D′ inside the ends L, instead of on the outside, as in Fig. 8, thus forming an oblong square link, with one side of the link operating in the ends of the spring, and the other side in the bearings upon the hind axle or front bolster of the gearing. The application, however, of these two last-described modifications to the rear axle and front bolster of the gearing differs from that of the two first-described modifications in this—to wit, that the bearing *v* (see Fig. 12) must be raised above the axle, bolster, and perches far enough to admit of the lower rod D′ swinging clear of the tops of the perches when vibrating the springs.

I will here state that as still another modification of the twin-rod connection, seen in Fig. 9, both rods may extend out past the ends L, as seen by the dotted lines O P, and connect the ends of the springs to the projecting pins P, and by the projecting pins O hang and operate the whole to the bearings *v*, Fig. 12.

I desire to have it expressly understood that while I have shown and described the arrangement of a tapering corrugation, B, to a single plate for springs, the same arrangement is equally applicable and valuable in springs made of two or more plates by a suitable proportion in the dimensions of said corrugation or rib B, so as to allow one plate to fit upon the other.

I claim as my invention—

1. In side and elliptic springs, having one or more plates, a corrugation, B, having its widest and deepest dimension at the center between the ends of the plate A, and tapering to a point, substantially as shown in the drawing, Figs. 1, 2, 3, and 4.

2. The plate A, having its widest portion at its center between the ends and its narrowest dimension at the extreme ends of the spring, having a single corrugation, B, whether the latter be of uniform width throughout, as seen in Fig. 5, or tapering from the center to the ends, as in Fig. 1, substantially as and for the purpose specified.

3. The plate A, Figs. 3 and 4, of uniform width throughout its entire length, having the tapering corrugation B, as and for the purpose specified.

4. The ears C C C C, formed solid on the edges of the plate, as and for the purpose set forth.

5. A tubular connecting-rod, D, Fig. 6, combined with the ends

of side springs to pleasure vehicles, substantially as shown and described.

6. The hubs E and E, Fig. 6, having arms I and I formed thereupon as part of the same, in combination with the connecting-rod D and ends of the springs A and A, as and for the purpose set forth.

7. The connecting-rod D, Fig. 7, having cranks K and K formed upon each end, and combined with the ends of the springs A, substantially as and for the purpose set forth.

8. Connecting the ends of side springs so as to equalize their action and compel them to move in unison with each other by means of twin connecting-rods D D′, Figs. 8, 9, and 12, constructed, applied, and operating substantially as shown and described.

CYRUS W. SALADEE.

Witnesses:
WM. HURLEY.
EDM. F. BROWN.

45 COMPLAINANTS' EXHIBIT G. A. C. Dustin, Notary.

DEPARTMENT OF THE INTERIOR,
UNITED STATES PATENT OFFICE.

To all persons to whom these presents shall come, Greeting:

This is to certify that the annexed is a true copy from the records of this office of an instrument of writing executed by Cyrus W. Saladee February 9, 1883, recorded in Liber K 29, page 182. Said record has been carefully compared with the original and is a correct transcript thereof.

In testimony whereof I, R. G. Dyrenforth, act'g Commissioner of Patents, have caused the seal of the Patent Office to be affixed this 2d day of June, in the year of our Lord one thousand eight hundred and eighty-four, and of the Independence of the United States the one hundred and eighth.

[SEAL.] R. G. DYRENFORTH,
Act'g Commissioner.

46 Liber K 29, p. 182.

To all whom it may concern:

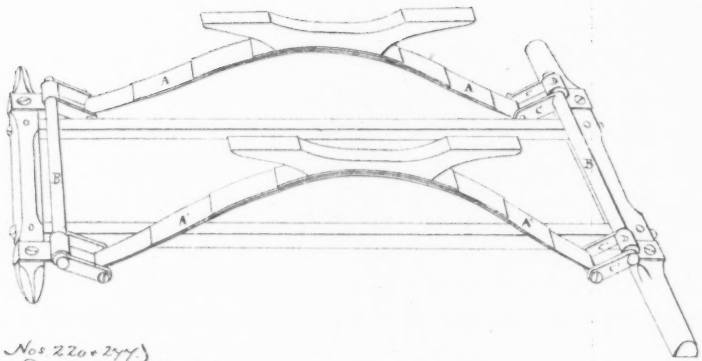
Be it known that on the 20th day of Feb'y, 1872, letters patent of the United States were issued to Cyrus W. Saladee for improvement in springs for vehicles, and for connecting rods securing the ends of the springs to the frame of the running gear, and which said letters patent are numbered one hundred twenty-three thousand nine hundred and thirty-seven (No. 123,937); and whereas Messrs. Topliff and Ely, of Elyria, State of Ohio, are desirous of acquiring the sole right, title, and control of the before-recited grant of letters patent:

Now, therefore, in consideration of one hundred dollars, paid by the said Topliff & Ely to the said Saladee, the receipt whereof is

Improvement in Connecting Carriage Springs.

No. 122,079. Patented Dec. 19, 1871.

Fig. 1.



Nos 220 & 277 Topliff & Topliff et al } p. 47

Fig 2.

Witnesses.

T. B. Hammond
Geo. P. Metcalf

Inventors.

John A. Topliff
Geo. H. Ely

hereby acknowledged, the said Saladee does by these presents sell, transfer, and assign unto the said Topliff & Ely all his right, title, and interests in and to the aforesaid letters patent in and for the whole of the United States and territories thereof for and during the term for which said patent is issued, and all claims for damage or profit which may have accrued to him against users or infringers of said letters patent since the date thereof and before the date of these presents, the same to be held and enjoyed by the said Topliff & Ely, their heirs and assigns, in all respects as fully and entirely as the same could have been held and enjoyed by the said Saladee if this sale and assignment had not been made by me.

Interlined between lines 5 and 6 from bottom of preceeding page before signing.

In testimony whereof the said Saladee hereunto sets his hand and seal on this the 9th day of Feb'y, A. D. 1883.

CYRUS W. SALADEE. [L. S.]

Witnesses:

A. SPELLMAN.
W. K. SHIREY.

Recorded Feb. 23, 1883.
Ex'd: H. M. H.; E. A. M.

48

122,079.

UNITED STATES PATENT OFFICE.

JOHN A. TOPLIFF and GEORGE H. ELY, of Elyria, Ohio.

Improvement in Connecting Carriage-Springs.

Specification forming part of Letters Patent No. 122,079, dated December 19, 1871.

To all whom it may concern:

Be it known that we, John A. Topliff and George H. Ely, of Elyria, in the county of Lorain and State of Ohio, have invented certain improvements in connecting carriage-springs, of which the following is a specification:

The nature and object of this invention are to so connect the springs on a carriage or other vehicle that they act together—that is, the motion up or down of either shall be conveyed to the other, thereby dividing the strain and preventing either side of the carriage from being depressed more than the other.

(Here follows diagram marked p. 47.)

Figure 1 represents the springs of a carriage and their attachments, Fig. 2 the connecting-rod.

A A and A′ A′ are the springs; B, the connecting-rod, which turns freely in the clips D D. C C and C′ C′ are the arms by which the springs A A and A′ A′ are attached to the connecting rod B. D D

are clips which attach the connecting-rod B to the gearing of the carriage. The arms C C C′ C′ are rigidly fastened to the rod B, so that when the spring A lengthens or contracts, thus causing the arms C C to move, the same movement will be transmitted to the arms C′ C′, which will cause spring A′ to lengthen or contract likewise, and *vice versa*. It will be observed that the position of each rock-rod B B′ is just in front of each axle and secured by the clips D; and that the arms C C C′ C′ are fixed to said rock-rods B B′ on each side of said clips D; and that the springs A A′ are secured between the inner ends of these arms so as to be braced laterally and allow both the front and rear ends of the springs to yield in unison with each other. By this arrangement the seat is allowed to yield in both directions without rolling; the position of the arms being always downward, those of each rock-rod, while moving together, can also move with each separate rod independent of the other.

What we claim is—

The arms C C C′ C′, arranged upon separate rock-rods B B′, secured directly to the front and rear axles to cause both ends of each spring to yield simultaneously and in unison with each other, and also to be laterally braced by said rock-rods, as described.

JOHN A. TOPLIFF.
GEO. H. ELY.

Witnesses:
T. B. HAMMOND.
GEO. P. METCALF.

50 4857.

UNITED STATES PATENT OFFICE.

JOHN A. TOPLIFF and GEORGE H. ELY, of Elyria, Ohio.

Improvement in Connecting Carriage-Springs.

Specification forming part of Letters Patent No. 122,079, dated December 19, 1871; Reissue No. 4857, dated April 9, 1872.

Specification.

Be it known that we, John A. Topliff and George H. Ely, of Elyria, in the county of Lorain and State of Ohio, have invented certain improvements in connecting springs to vehicles, of which the following is a specification embodying our invention:

Our invention relates to side half-elliptic-spring vehicles, and has for its object suspending the front and rear ends of the springs directly to the rear axle and front bolster of the running-gear by means of two separate connecting-rods, the outer ends of which have formed upon them, as a part of the same and at right angles with the rod, short arms, between which the ends of the springs, respectively, are secured and operated—the connecting-rod receiving the rear ends of the springs being hinged to the rear axle, while the rod receiving the front ends of the springs is in like manner connected

to the front bolster in such manner that the vibration of the springs will impart a corresponding rotation to the connecting-rods, front and back, and so that the depression of either spring will, by the rotary action imparted to the connecting-rod, compel a corresponding depression of the other, and thus compel both springs to vibrate together and move in unison one with the other, equalizing their action and the weight imposed upon them, as well as to prevent side motion to the body of the vehicle.

We are fully aware that to attain the object hereinbefore recited by means of connecting-rods placed at right angles across the front and rear of the running-gear of vehicles, and hinged to the front bolster and rear axle, or upon perches, and in close proximity to the bolster and axle, is an old device, and which is no part of our invention.

We deem it proper in this connection to cite the instances of prior use of connecting-rods for the purpose of equalizing the load imposed upon the springs of vehicles, as also the equalization of the action of the springs, so far as known to us, the better to illustrate the distinctive difference between our invention and all others pertaining to the use of the connecting-rod for the purposes specified. The first instance we cite is the patent granted to Joshua Jones, Allen M. Eells, and Horace Griswold, No. 842, and dated the 16th day of July, 1838. In this patent is clearly shown two separate connecting-rods, one hinged to the hind axle and rear end of the body, and the other to the front bolster and front end of the body, and arranged in combination with a coiled or scroll spring, located about midway between the front bolster and rear axle. Secondly, we cite the rejected application for a patent of Eli Petteys, rejected upon the patent last-above cited on the 27th day of July, 1850. Here also two separate connecting-rods are shown—one across the front and one across the rear of the running-gear—but no side springs are shown in combination therewith. The third and fourth we cite in the two several patents granted to Anson C. Stowe, dated November 24, 1868, and December 22, 1868. In both of these patents two separate connecting-rods at right angles across the running-gear are shown and described, the one in connection with C-springs, and the other with side springs; but in the last-named case the connecting-rods are not connected directly with the ends of the springs. And, finally, the last case we cite is the patent granted to John B. Augur, No. 108,085, and dated the 11th day of October, 1870. In this patent side springs are used, the front ends of which are hinged upon fixed and rigid standards, secured upon the top of the front bolster, and where the front ends of the spring are firmly held in a central position over said bolster, while the rear ends are hinged to hinges secured to the outer ends of a single connecting-rod, placed over the top of the rear axle in such manner that as the springs are lengthened by depression a corresponding rotation is imparted to the connecting-rod. In this case provision for the lengthening of the springs when depressed or in motion is only made for the rear ends of the springs, the front ends being firmly held over the center of the bolster; and hence, as the load upon the springs is increased, and as only their

rear ends, in combination with said links and connecting-rod, are permitted to accommodate their vibration, the rear end of the body is caused to have a backward tipping motion—that is, the back end of the body is thrown lower than the front when the springs
51 are depressed to their full capacity, which is an objectionable feature in this device for equalizing the action of springs. Besides, as only the rear ends of the springs are allowed to act, that easy and natural motion of the springs which is only had by allowing both ends to act freely is in a great measure lost.

The radical difference of our invention from each and all of the cases above cited is, first, in the construction of the connecting-rod; and secondly, in suspending both ends of the springs upon separate connecting-rods, and thus allow both ends of the springs to act freely and in harmony with their vibrating motion, to which is added the other important advantage—viz., that our arrangement of connecting-rods admits of their application to side-spring vehicles of the ordinary kind now in use, as readily as to those built expressly for the purpose—an advantage not attained by any other previously-known combination of connecting-rods with the springs or bodies of vehicles.

(Here follows diagram marked p. 49.)

In the drawing, figure 1 represents a top view of the hind axle, perches, and front bolster of a carriage running-gear, and Fig. 2 is side view of the same.

A A and A′ A′ are the springs; B B′, the connecting-rods, which turn freely in the bearings D D D D; C C and C′ C′ are short arms formed upon the outer ends of the connecting-rods by being welded or otherwise fastened thereto and made a part of the same, and between which the ends of the springs are secured and operated by a passing bolt, as clearly shown in the drawing. D D are the bearings which attach the connecting-rods to the rear axle and to the front bolster. The arms C C C′ C′ being formed solid with the connecting-rods, when the spring A vibrates so as to lengthen or contract, causes the arms C C to move accordingly, when the same movement will be transmitted through the connecting-rod to the arms C′ C′, which will cause the opposite spring A′ to lengthen or contract in like proportion, or nearly so, the same as spring A.

With the several parts combined, arranged, and operating as clearly shown and described, it is self-evident that both the front and rear ends of the springs must act freely upon their suspended bearings between the arms C C′ of the connecting-rods B B′ under the pressure of the weight imposed upon them, and in unison with each other; and the position of the arms being always downward at their outer ends, those of each connecting-rod, while moving together, can also move with each separate rod independent of the other, as when a greater proportion of the weight carried is nearer the front or rear end of the springs, or, as when the front wheels strike an obstacle in the road which is missed by the hind ones, or *vice versa*.

JOHN A. TOPLIFF & GEORGE H. ELY. 49

Improvement in Connecting Carriage Spings.

No. 4,857. Reissued April 9, 1872.

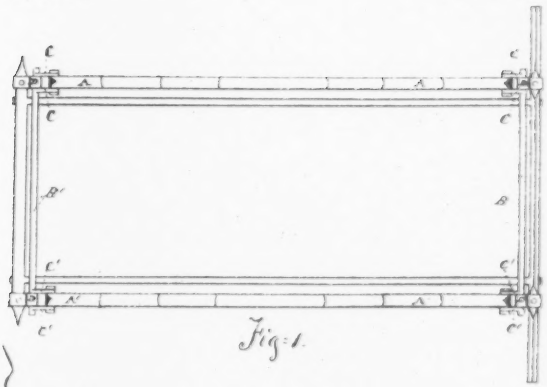


Fig: 1.

Nos 220
" 277
Topliff
v.
Topliff
et al.
} p. 449

Fig: 2.

Witnesses.

W. Dalaee

D. B. Hammond

Inventors.

John A. Topliff

Geo. H. Ely

Claim.

We claim—

The arms C C C′ C′, arranged upon separate connecting-rods B B′, secured directly to the hind axle and front bolster, to cause both ends of the side springs to yield simultaneously and in unison with each other, in the manner shown and described.

JOHN A. TOPLIFF.
GEO. H. ELY.

Witnesses:
W. SALADEE.
T. B. HAMMOND.

53 UNITED STATES PATENT OFFICE.

JOHN A. TOPLIFF and GEORGE H. ELY, of Elyria, Ohio.

Improvement in Connecting Springs to Vehicles.

Specification forming part of Letters Patent No. 122,079, dated December 19, 1871; Reissue No. 4857, dated April 9, 1872; Reissue No. 7017, dated March 28, 1876; application filed May 16, 1872.

To all whom it may concern:

Be it known that we, John A. Topliff and Geo. H. Ely, of Elyria, in the county of Lorain and State of Ohio, have invented certain improvements in connecting springs to vehicles, of which the following is a specification embodying our invention:

Our invention relates to side half-elliptic spring vehicles, and has for its object suspending the front and rear ends of the springs directly to the rear axle and front bolster of the running-gear by means of two separate connecting-rods, the outer ends of which have formed upon them, as a part of the same, and at right angles with the rod, short arms, between which the ends of the springs, respectively, are secured and operated, the connecting-rod receiving the rear ends of the springs, being hinged to the rear axle, while the rod receiving the front ends of the springs is, in like manner, connected to the front bolster in such manner that the vibration of the springs will impart a corresponding rotation to the connecting-rods front and back, and so that the depression of either spring will, by the rotary action imparted to the connecting-rod, compel a corresponding depression of the other, and thus compel both springs to vibrate together, and move in unison one with the other, equalizing their action and the weight imposed upon them, as well to prevent side motion to the body of the vehicle.

We are fully aware that to attain the object hereinbefore recited, by means of connecting-rods placed at right angles across the front and rear of the running-gear of vehicles, and hinged to the front bolster and rear axle, or upon perches, and in close proximity to the bolster and axle, is an old device, and which is no part of our invention.

We deem it proper in this connection to cite the instances of prior

use of connecting-rods for the purpose of equalizing the load imposed upon the springs of vehicles, as also the equalization of the action of the springs, so far as known to us, the better to illustrate the distinctive difference between our invention and all others pertaining to the use of the connecting-rod for the purposes specified.

The first instance we cite is the patent granted to Joshua Jones, Allan M. Eells, and Horace Griswold, No. 842, and dated the 16th day of July, 1838. In this patent is clearly shown two separate connecting-rods, one hinged to the hind axle and rear end of the body, and the other to the front bolster and front end of the body, and arranged in combination with a coiled or scroll spring located about midway between the front bolster and rear axle.

Secondly, we cite the rejected application for a patent of Eli Petteys, rejected upon the patent last above cited on the 27th day of July, 1850. Here also two separate connecting-rods are shown—one across the front, and one across the rear, of the running-gear—but no side springs are shown in combination therewith.

The third and fourth we cite in the two several patents granted to Anson C. Stowe, dated November 24, 1868, and December 22, 1868. In both of these patents two separate connecting-rods at right angles across the running-gear are shown and described, the one in connection with C-springs, and the other with side springs; but in the last-named case the connecting-rods are not connected directly with the ends of the springs; and, finally, the last case we cite is the patent granted to John B. Augur, No. 108,085, and dated the 11th day of October, 1870. In this patent side springs are used, the front ends of which are hinged upon fixed and rigid standards secured upon the top of the front bolster, and where the front ends of the spring are firmly held in a central position over said bolster, while the rear ends are hinged to hinges secured to the outer ends of a single connecting-rod placed over the top of the rear axle in such a manner that as the springs are lengthened by depression a corresponding rotation is imparted to the connecting-rod. In this case provision for the lengthening of the springs when depressed or in motion is only made for the rear ends of the springs, the front ends being firmly held over the center of the bolster; and hence, as the load upon the springs is increased, and as only their rear ends, in combination with said links and connecting-rod, are permitted to accommodate their vibration, the rear end of the body is caused to have a backward tipping motion—that is, the back end of the
54 body is thrown lower than the front end when the springs are depressed to their full capacity—which is an objectionable feature in this device for equalizing the action of springs; besides, as only the rear ends of the springs are allowed to act, that easy and natural motion of the springs which is only had by allowing both ends to act freely is in a great measure lost.

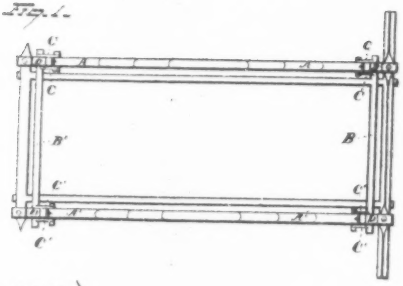
The radical difference of our invention from each and all of the cases above cited is, first, in the construction of the connecting-rod; and, secondly, in suspending both ends of the springs upon separate connecting-rods, and thus allow both ends of the springs to act freely and in harmony with their vibrating motion, to which is added the

J. A. TOPLIFF & G. H. ELY. 52

CONNECTING-SPRINGS TO VEHICLES.

No. 7,017. Reissued March 28, 1876.

Fig. 1.



Nos 2220 2277.
Topliff
Topliff Md.
D. 52

Fig. 2.

WITNESSES
C. F. Nottingham.
A. W. Bright

INVENTOR
John A. Topliff
Geo. H. Ely
By Keppler & Dyer, Attorneys

other important advantage, viz: that arrangement of connecting-rods admits of their application to side-spring vehicles of the ordinary kind now in use as readily as to those built expressly for the purpose—an advantage not attained by any other previously-known combination of connecting-rods with the springs or bodies of vehicles.

(Here follows diagram marked p. 52.)

In the drawing, figure 1 represents a top view of the hind axle, perches, and front bolster of a carriage running-gear; and Fig. 2 is a side view of the same.

A A and A′ A′ are the springs; B B′, the connecting-rods, which turn freely in the bearings D D D D. C C and C′ C′ are short arms formed upon the outer ends of the connecting-rods by being welded or otherwise fastened thereto and made a part of the same, and between which the ends of the springs are secured and operated by a passing bolt, as clearly shown in the drawing. D D are the bearings which attach the connecting-rods to the rear axle and front bolster.

The arms C C C′ C′ being formed solid with the connecting-rods, when the spring A vibrates, so as to lengthen or contract, causes the arms C C to move accordingly, when the same movement will be transmitted through the connecting-rod to the arms C′ C′, which will cause the opposite spring A′ to lengthen or contract in like proportion, or nearly so, the same as spring A.

With the several parts combined, arranged, and operated as clearly shown and described, it is self-evident that both front and rear ends of the springs must act freely upon their suspended bearings between arms C C′ of the connecting-rods B B′ under the pressure of the weight imposed upon them, and in unison with each other; and the position of the arms being always downward at their outer ends, those of each connecting-rod, while moving together, can also move with each separate rod independent of the other, as when a greater proportion of the weight carried is nearer the front or rear end of the springs, or as when the front wheel strikes an obstacle in the road, which is missed by the hind ones, or *vice versa*.

We claim—

1. The combination of two connecting-rods located at the front and rear ends of a wagon-body, and arranged to turn in their bearings, with a pair of half-elliptic springs, whereby the springs are caused to yield in unison with each other, substantially as and for the purpose set forth.

2. The combination of the connecting-rods B B′, provided with arms at their ends, with the half-elliptic springs A A′, substantially as and for the purpose set forth.

J. A. TOPLIFF.
GEO. H. ELY.

Witnesses:
HEMAN ELY.
N. L. JOHNSON.

55 STATE OF OHIO, }
Cuyahoga County, } ss:

I, A. C. Dustin, a notary public in and for the county and State aforesaid, duly commissioned and qualified, do hereby certify that the foregoing deposition was taken before me on the 10th day of September, A. D. 1884, the time and manner of taking the same being agreed upon by the counsel of the parties respectively; that the exhibits marked "Complainants' Exhibits" "A," "B," "C," "D," "E," "F," "G," "H," "I," "K," "L" were offered in evidence by complainants' counsel as a part of this deposition and in my presence marked respectively as aforesaid and were by me attached to this deposition; that the above-named witness, George H. Ely, was by me first sworn to testify the truth, the whole truth, and nothing but the truth, and the deposition as above written was, by the agreement of counsel of the respective parties, taken by me in short-hand and thereafter transcribed by me upon the typewriter, and the name of the said witness was, by the agreement of counsel as aforesaid and by the authority of the witness, by me subscribed to the deposition as above written; and I hereby certify that the same is a true and correct transcription of the testimony of the said witness as taken in my presence; and I further certify that the stipulation hereto attached and made a part of this deposition was agreed to in my presence by the counsel of both the parties to this action, and that this deposition with all the exhibits attached will be retained by me until I shall personally deliver the same to the clerk
56 of the said circuit court of the United States for the northern district of Ohio to be filed in this action.

I do further certify that I am not a relative of either party or otherwise interested in the event of this action.

In witness whereof I have hereunto set my hand and seal of office this 26th day of September, A. D. 1884.

[SEAL.] A. C. DUSTIN,
Notary Public.

Notary fee, $5.00, paid by complainants.

57 And afterwards, to wit, on the 10th day of February, A. D. 1885, a deposition was filed on behalf of the respondent, and which is in the words and figures following, to wit:

In the Circuit Court of the United States, Northern District of Ohio Eastern Division.

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF.

Depositions taken before me, Henry J. Davies, a notary public within and for the county of Cuyahoga, in the State of Ohio, by consent and agreement of parties, at the office of Messrs. Boynton and Hale, at Cleveland, in said county, on the 23rd and 27th days of January, 1885, to be read in evidence on behalf of the respondent in the above-entitled action.

Present: Henry S. Sherman, Esq., on behalf of complainants, and Hons. W. W. Boynton and Jno. C. Hale, on behalf of respondent.

58 ISAAC N. TOPLIFF, of lawful age, being by me first duly sworn, as hereinafter certified, deposes and says as follows:

(By Judge BOYNTON:) State whether you are the defendant in the action.

A. I am, sir.

Q. Give your age and place of business.

A. Fifty-two years old; Cleveland.

Q. What is your occupation?

A. Manufacturer.

Q. What manufacturing business are you carrying on?

A. Articles of carriage hardware.

Q. How long have you been engaged in manufacturing such articles?

A. Five years.

Q. State whether you are a practical mechanic.

A. I am.

Q. How long have you been?

A. Thirty years, nearly.

Q. Of what mechanism?

A. Carriage manufacturer.

Q. State whether or not you have been engaged more or less for thirty years in carriage-making.

A. I was engaged over twenty years, I think, in carriage-making and five or six years in manufacturing carriage hardware.

Q. State whether you were engaged for any period of time in the labor of making carriages.

A. Yes, sir; some ten or twelve years of the time.

59 Q. Are you acquainted with the connecting rod described in the letters patent mentioned in the plaintiffs' bill?

A. Yes, sir; I am.

Q. How long have you been acquainted with that rod?

A. Some ten or twelve years; ever since it was patented. I do not just remember the date.

Q. Will you please examine "Complainants' Exhibit A," attached to the deposition taken by the complainants in this case, and state

whether you recognize that exhibit as a sample of the rod that they make.

A. I should think it was; yes, sir. That is a model sample.

Q. State whether the model sample attached to your deposition and marked "Defendant's Exhibit A" is a model sample of the patent of the plaintiff or illustrates the patent.

A. It illustrates the principle; it is not just as they make it. The rods are a little different, but that is immaterial. It is practically the same.

Q. That model sample illustrates the principle covered by their patent?

A. Yes; I should judge so.

Q. Will you annex this to and make it a part of your deposition as "Defendant's Exhibit A"?

A. Yes, sir.

Q. State what the model sample that you now have before you and which is attached to your deposition as "Defendant's Exhibit B" is.

A. It is a model of the Stringfellow and Surles patent of January 15, 1861.

60 —. Will you attach said model to your deposition and mark it "Defendant's Exhibit B"?

Objected to.

A. Yes, sir.

Q. State whether you have examined the rods that are manufactured under the two patents.

A. Yes, sir.

Q. State how they differ in principle, if at all.

Objected to.

A. No difference in the operation. They are both rigid rods.

Q. For what purpose are they both made?

Objected to.

A. To equalize the strain from one side to the other and to make the buggy ride level.

Q. State wherein the thing patented by Topliff & Ely differs in principle from the thing patented by Stringfellow & Surles.

Objected to.

A. The only difference is in the manner of hanging. The Stringfellow and Surles patent was obtained a good many years ago, when it was the style to hang buggy bodies high, and it was hung on these C-shaped jacks for that purpose.

Q. You mean by the "C-shaped jacks" those that are exhibited by the model?

A. Those represented by the model and drawing. The style of manufacture of recent date, the Topliff & Ely style, is to get them low so that they are hung down onto the bars. That is all the practical difference there is.

Q. I understood you that buggy bodies were constructed higher at the time of the Stringfellow and Surles patent than they now are.

61 Objected to.

A. Yes, sir.

Q. If they differ in any other respect than the one you have mentioned state it.

Objected to.

A. I do not know of any other difference, only in the manner of construction.

Q. Is there any difference in their operation?

Objected to.

A. No difference; no, sir.

Q. Is there any difference in the principle of construction?

Objected to.

A. I have not been able to find any difference.

Q. State whether or not the Topliff and Ely patent effects any other object than the one above stated in your deposition—that is, to equalize the strain.

A. To equalize the strain and prevent the body pulling over onto you when you get into it. This Stringfellow and Surles patent does the same thing.

Q. Is there any difference in that respect in the operation of the two?

Objected to.

A. No difference at all; no, sir.

Q. How long have you known the Stringfellow and Surles patent to have been in existence?

A. I have only seen it in the models and the Patent Office reports. I never saw any in actual use.

All questions and answers relative to the Stringfellow and Surles patent are objected to.

62 Q. State whether the model "Defendant's Exhibit B" is correctly made from the description in "Exhibit C" hereto attached.

A. It is.

Q. State whether or not it is made in conformity to this description.

A. The description and the drawings. Yes, sir; in strict conformity.

Q. State whether you have examined the specifications of the Auger patent mentioned in the complainants' bill.

A. I have; I am acquainted with them.

Q. Have you examined a description of the patent?

A. Yes, sir.

Q. Have you seen the thing itself alleged to be patented?
A. Yes, sir.
Q. Have you noticed its operation?
A. Yes, sir.
Q. State how it differs in principle, if at all, from the Stringfellow & Surles patent.

Objected to.

A. There is no difference, excepting the rod is at one end and the arms are hung up instead of down. That is all the difference. There is no difference in principle.
Q. What is the difference in its operation and the purpose that it subserves?
A. In the Augur patent the rod pushes back, but it regulates and evens the body just the same as the Topliff & Ely or the Stringfellow.
Q. Then it subserves the same purpose?

Objected to.

63 A. It is one single rod that the arms throw back instead of down. That is all the practical difference there is.
Q. Has it any other or further practical operation or effect?

Objected to.

A. None that I know of.
Q. Will you examine figure one in "Exhibit D," A. C. Stowe's carriage spring, patented November 24th, 1868, and state wherein the t-ing patented differs in principle or in operation from the thing patented by Stringfellow & Surles or by Topliff and Ely?

Objected to.

A. The object of the rod and the workings of the rod are the same, but it is different in connection. It connects indirectly with a spring. In the Stowe patent the connection is indirectly from the spring.
Q. What different operation has it—what different purpose does it subserve—from the Topliff and Ely patent or the Stringfellow and Surles patent, if any?

Objected to.

A. There is no difference in the operation of it.
Q. State what the operation is.

Objected to.

A. It is an even up-and-down motion.
Q. And what is the object of it?

Objected to.

A. The object is to prevent a rocking or tipping of the buggy body sideways when more of a load is one one side than on the other.
Q. Will you examine figure 2 in C. M. Sexton's running gear,

patented August 18, 1868, represented by "Exhibit E" hereto
64 attached, and state wherein that differs in principle from Topliff and Ely's?

Objected to.

A. This appears to represent two rods at each end of four half springs, and seems to operate, from the drawings, just the same as the Topliff & Ely, the Augur, and the Stringfellow patents in principle.

Q. State whether you will make this exhibit and the last one part of your deposition.

Objected to.

A. I will; yes, sir.

Q. State what purpose the Sexton patent subserves in the manufacture of carriages.

Objected to.

A. It is to make the carriage body ride level when the load may be on one side more than on the other.

Q. What other or different object has it than that of the Topliff and Ely patent?

Objected to.

A. I see no other object.

Q. Has it any other effect than to keep the carriage body level, as you say, when one side is loaded and the other is not?

Objected to.

A. No other, except what I have mentioned—to equalize the strain.

Q. Examine "Complainants' Exhibit L," attached to their deposition, and state how long you have known that thing to have been manufactured.

A. In this same way, for the same purpose?

65 Q. For any purpose.

A. I have known it for 20 years and over.

Q. How long have you known it to be manufactured for the purpose for which this is now used in connection with carriages?

A. I think the Saladee was the first that I knew to be manufactured for use in connection with carriages, but the principle of squaring a rod and driving it into a square hole is old.

Q. State whether you have known heretofore the spring, the hub, and the rod to have been used in the manufacture of anything; if so, what, and how long have you known it?

A. I do not know that I have ever known it in connection with a spring, but I have seen a good many things with a square hub and a barrel.

Q. For how long?

A. For twenty-five years.

Q. State whether or not it was in public use by manufacturers.

Objected to.

A. Yes, sir; it was in common use.

Q. State how universal its use was or how common its use was.

Objected to.

A. It is a common thing in use and has been for a great many years.

Q. How many years would you say that it had been in common use?

Objected to.

A. Ever since the making of malleable iron, I think.

66 Cross-examination by Mr. SHERMAN:

Q. What part of carriages were you engaged in making during the ten or twelve years that you labored practically at the business?

A. I carried on carriage-making; had the general supervision of the works. Carriage-trimming was my particular branch, but I carried on a factory some twelve or fifteen years.

Q. But the trade you learned was carriage-trimming?

A. Carr*ai*ge-trimming—yes, sir.

Q. That trade had nothing to do with the manufacture of the wood or the iron part of the carriage, had it?

A. No, sir.

Q. What was the first connecting rod that you ever saw in practical use?

A. I think the first rod that I ever saw in practical use was the Topliff and Ely rod.

Q. Where was that being made?

A. In Elyria.

Q. Were you connected with Topliff and Ely at the time?

A. Yes, sir; I was working for them.

Q. That was about the time that the first patent was taken out, was it not?

A. Yes, sir.

Q. And the kind they were making there then was substantially the same kind as is shown in "Model A" of complainants' deposition, was it not?

A. Yes, sir.

Q. From that time on how long did they continue to manufacture that, if you know?

A. I bel*ei*ve they are making the same kind yet.

67 Q. How much of a business had they in the way of making those connecting rods?

Objected to.

A. I do not know what the extent of their business was. Quite a number of hundred sets, and perhaps thousands, were sold yearly.

Q. They carried it on as a part of their business of making carriage hardware, did they not?

A. Yes, sir; some specialties in carriage hardware.

Q. I think you said that up to the time you first saw these at Topliff and Ely's establishment you never had seen any in practical use?

A. In practical use? No.

Q. Had you ever heard of the connecting rod until then?

A. No, sir.

Q. The "Model A" attached to your deposition is a model that was made by you or under your direction?

A. Yes, sir.

Q. And that is a model not only of the connecting rod made by Topliff and Ely, but is also a model of the connecting rod that you have been making, is it not?

A. It is a model of the rod made by me. It is not exactly like theirs, but very near.

Q. Practically speaking, there is no difference between the rod that you have been making and the rod that Topliff and Ely have been making?

A. None in principle; simply in shape.

Q. They may differ in some minor, unimportant particulars?

A. Yes, sir.

68 Q. But otherwise they are the same?

A. The same; yes, sir.

Q. Where was this "Model B," attached to your deposition, made, and who made it?

A. That was made in my factory, by my men.

Q. Under your direction?

A. Yes, sir.

Q. And that model, you say, is constructed according to the specifications and the drawings contained in the patent of Stringfellow and Surles which you have introduced, marked "Defendant's Exhibit C"?

A. Yes, sir; it was made after their drawings.

Q. In making this model it was your intention, I presume, to make it in exact accordance with the specifications and the drawings?

A. That was the intention.

Q. And you say that it is so made?

A. I believe it to be so. I told the men to make it in those proportions.

Q. What experience have you had in constructing models from patent specifications and drawings?

A. I have made models, but I never made them from Patent Office drawings that I know of; but I have made them from drawings often.

Q. What experience have you had in making models from Patent Office specifications?

A. This is the only one that I have ever made from Patent Office specifications.

Q. Will you state whether that model was made in pro-

69 portion to the drawing attached to the Stringfellow and Surles patent?

A. I told my foreman to make it about the same proportion—sufficient to show the principle.

Q. Have you ever tested it to see whether it was made in the same proportion?

A. No; I never have.

Q. You preserved the same proportion of parts?

A. That was the intention.

Q. Is it not a fact, in your experience in making models from drawings, that the increase or decrease of proportions in the model will produce different effects in the working of the machine?

A. I have noticed that models seldom work as well as full-sized gears. I do not know that the changing of the proportion might have any great effect. A slight change would not.

Q. How would it be in case of a very material change in proportion?

A. It would depend upon where the change was. In some places it would make a difference and in others it would not.

Q. Suppose you should increase the height of these C-shaped springs two or three times, leaving all the other parts just as they are, would the springs need as much bracing?

A. They would need more bracing.

Q. And as you diminished the height of these C-shaped jacks or springs in your model and the links the springs would need less bracing?

A. Would need less bracing; yes, sir.

Q. Suppose you increase the C-shaped jacks and the links two or three times without increasing the weight or thickness of the

70 brace, would the action of the springs be equalized as completely as it would if the C-shaped jacks were left in the same proportion that you have made that model?

A. It would not make any difference; it would work just as well. We have ascertained that in making these equalizers that I made several times. We have made them with longer links, to see if they would work any better, and they do not work any better at all than they do with the shorter links.

Q. Now, you are speaking of your experience with rods made under the Topliff and Ely or the Saladee patent, are you not?

A. Yes, sir; the same principle is here.

Q. I understand you to say you never have seen the Stringfellow and Searles patent in practical operation?

A. On a buggy? No, sir.

Q. You never have seen anything like it except in the patent specifications and drawings and in the model you have made?

A. That is all.

Q. So that, as a matter of fact, you are not able to state how this device of Stringfellow and Searles works in practice?

A. No, sir; I never have seen it on a buggy.

Q. I wish you would take "Exhibit C," attached to your deposi-

tion, and measure the height of the C-shaped jacks as shown in the drawings.

A. It is an inch and a half.

Q. Now measure on the patent drawings the distance shown in those drawings between the feet of the C-shaped jacks or the places where they are fastened onto the wagon gear.

A. Four inches.

Q. Now, will you give the measurements of the same parts in your model?

71 A. Four inches and a quarter is the height of the C-shaped jacks, and twenty inches is the distance between the feet of the front and rear C-shaped jacks on the model.

Q. What is the ratio of height to distance in the drawing?

A. It is an inch and a half to four.

Q. And what in the model?

A. Four and a quarter to twenty.

Q. Take "Exhibit C," attached to your deposition, and show where in the specifications there is any claim or mention of any equalization of springs.

A. I do not know that it is mentioned there. I do not see that they mention any equalization of springs; but it is shown in the model.

Q. What is the forked iron rod connecting each end of the spring and the C-shaped jack to the other spring and the C-shaped jack called in the patent?

A. They call it "a lateral brace or tie."

Q. And what is stated to be the object or purpose of that "lateral brace or tie"?

A. It is "to prevent the swaying of the carriage body from twisting or bending the supports C C' laterally."

Q. Is there any other object or purpose claimed for that in the patent?

A. To make an easy swinging motion.

Q. In what direction?

A. Longitudinally, to prevent the motion laterally.

Q. State whether you have ever seen any of the devices described in the Stowe patent in practical use.

A. No, sir; I have not.

72 Q. State whether you have seen any described in the Sexton patent.

A. No, sir.

Q. State whether you have seen any of the devices named in either of those two patents in practical operation anywhere.

A. No; I never have.

Q. Then, what you describe as what seems to be their operation is the idea you get from the drawing and the specifications?

A. Yes, sir.

Q. You have said that you have seen the hub with arms shown in "Complainants' Exhibit L" for twenty years or more?

A. Yes, sir.

Q. Had you ever seen it used in combination with side springs

and a connecting rod until you saw it in use either under the Saladee patent or under the Topliff and Ely patent?

A. No, sir.

Q. When did you first see the Stringfellow and Surles patent?

A. I do not know; I should think a year and a half ago.

Q. When did you first see the Sexton and the Stowe patents?

A. About the same time.

Q. When did you commence making connecting rods similar to those shown in "Complainants' Exhibit A" and "Defendant's Exhibit A"?

A. Two years ago, I think.

Q. Were those the first connecting rods that you had made?

A. No; I had made some with mall-able ends before.

Q. When did you first commence making connecting rods containing a combination of a rod, arms, and side springs?

A. About three years ago.

Q. Can you fix the date any nearer than that?

A. No; I cannot.

73 Q. That was in 1882, then?

A. About the first of the year.

Q. You had knowledge at that time of the existence of the Topliff and Ely patents, had you not?

A. Yes, sir.

Q. Did you know of any other parties, aside from Topliff and Ely, that were making connecting rods?

A. Yes, sir.

Q. Who?

A. A firm in Chicago has been making them for a number of years—a carriage-maker there by the name of Pennoyer.

Q. Pennoyer and Co.?

A. I do not know the name of the firm.

Q. When was it that you knew of his making them?

A. He has made them for ten years.

Q. Do you know to what extent he has been making them?

A. No; I do not know to what extent.

Q. Do you know whether he was working under a license or not?

A. I do not know.

Q. Did you know of any one else up to that time when you begun making them or since then except this Chicago firm?

A. No, sir; I do not think of any other.

Q. Were there any connecting rods on the market up to the time you began making them except the Topliff and Ely and those that may have been made by this Chicago firm?

A. I do not know of any.

Q. Do you know whether any of the connecting rods made by the Chicago firm were on the market?

A. No; I do not know that they were.

74 Q. You simply heard that some firm was making them?

A. I have seen them on their carriages. They made them for their own use.

Q. How do you know that those did not come from Topliff and Ely?

A. From the style of make, and the gentleman told me that they made them themselves.

Q. A member of the Chicago firm told you that they made them themselves?

A. Yes, sir.

Q. Did he mention the fact of any license?

A. No, sir; he asked me to make some for him like his. He made them of a little different shape from those, and he wanted me to make some like them for him.

Q. Did you do so?

A. No, sir.

Q. Is it not a fact that up to the time you began making in 1882 Topliff and Ely had practically a monopoly of this business, and is it not a fact that since that time they have had a monopoly of it, with the exception of what you have done?

A. I think that what they have made and what I have made is almost all that has been on the market. I have seen no others.

Q. Prior to the time you began to make them, is it not a fact that they were the only parties in the United States that were making these, to your knowledge?

A. With the exception of a few that Mr. Saladee made at Pittsburgh. He made some.

Q. Under his own patent?

A. Yes, sir; and those that were made with the Augur buggy; but I do not know that they ever put any on the market.

75 Q. Did you ever see any made by Augur?

A. Yes, sir; I have seen the Augur patent on their buggies.

Q. Some that were said to be made by Augur?

A. Yes, sir.

Q. Have you any personal knowledge that they were made by Augur?

A. No, sir; but they were on the Augur buggies.

Q. How many of those did you see?

A. I never have seen many of them; a few buggies with the Augur schackle on or equalizers.

Redirect examination:

Q. Was Augur a carriage-maker?

A. Yes, sir.

Q. Do you know how long he had been engaged in the business?

A. No, sir; I do not.

Q. Is Pennoyer a carriage-maker?

A. Yes, sir; a carriage-maker of long standing; I should think forty years. He is quite an old man.

Q. You state as long as ten years years ago you saw rods that he had been manufacturing?

A. Yes, sir.

dicular motion on this side of the body of the carriage to the other side in a measure.

Q. State now wherein the invention represented by "Exhibit A" of the complainants differs in principle or operation from the invention represented by "Exhibit B;" or if it does not differ at all in principle, state that fact. By "invention" I mean the thing itself built and put into a wagon gear. Take a carriage that has the one spring in it and a carriage that has the other spring in it, and state wherein they would differ in their operation.

Objected to.

A. It seems to me that in principle they differ none at all. In construction they differ in a small measure, which is in the proportion of this length in this model "Exhibit B" as it is shown here. This C-shaped jack may be elongated a little and it makes the proportion in construction exactly the same. The difference now between "Complainants' Exhibit A" and "Defendant's Exhibit B" is merely a matter of proportion. The principle is exactly the same, but the construction is a little different, in the fact that the spring in "Defendant's Exhibit B" is proportionately longer than in "Complainants' Exhibit A." It is merely a matter of proportion and not of principle. Cut off this connecting rod in each case and you have the old-fashioned carriages. You have seen carriages built like that with this spring, and it is commoner to
80 build them with this kind of clip, but without any connecting rod. The only feature in which either of these differs from the ordinary spring which has for years been in use is in having this cross connecting rod, which is stiff and made so as to be subject to as little torsion as possible. Cut that one element out and both are the old-fashioned springs. So, in my estimation, that is in each case the whole virtue of the invention.

Q. You mean the cross connecting rod?

A. This rigid connecting rod.

Q. State whether "Defendant's Exhibit A" and "Defendant's Exhibit B" differ at all in principle.

Objected to.

A. I do not see that they do at all. The difference here is simply a matter of proportion in the length of the links in proportion to their distance apart. I see no difference in principle in these.

Q. Both effect the same object?

Objected to.

A. Both effect the same object. The C pieces are brought together so that the proportion is less between the centers of the shackles than between the centers of the springs. "Defendant's Exhibit B" could be straightened out a little or the springs shortened and be of exactly the same proportion as "Defendant's Exhibit A." Of course, the principle would not be changed. If the spring in "Defendant's Exhibit B" was bent to a greater degree than it is now

(and some springs are often made at a greater angle than that) it would bring these shackles to the same angle that they are
81 now brought in "Complainants' Exhibit A;" but the principle is not changed.

—. Suppose "Defendant's Exhibit B" was four inches higher and of the same length, how would that effect its operation upon the carriage or the principle of it?

Objected to.

A. Do you mean simply lengthening these C pieces?
A. Yes.

Objected to.

A. I do not see that there would be any change at all.
Q. The effect would be the same?

Objected to.

A. The effect would be the same. Their relation would be the same as now; but if, on the other hand, the center of the spring in "Defendant's Exhibit B" were brought up four inches higher, all the other proportions remaining the same, then you have the shackles at the same angle that they are now in "Complainants' Exhibit A;" but the principle would not be changed at all.

Q. Suppose the cross-rod on "Defendant's Exhibit B" to be hung four inches lower than it is now, how would it then compare with "Complainants' Exhibit A"?

Objected to.

A. It would not be changed in the least by hanging it four inches lower. It would be just the same as it is now in principle and in action. It would not be changed.

Q. Would it make any difference in the operation of the device as a means of equalizing the depression of the springs whether the cross connecting bar was made as shown in "Defendant's Exhibit B" or "Complainants' Exhibit A"?

Objected to.

A. There is no difference at all in the principle of that,
82 whether it is as in the "Complainants' Exhibit A" or as in the "Defendant's Exhibit B" or even if it were connected at the lower end of these shackles in "Defendant's Exhibit B." The principle is exactly the same, the object of it being simply to communicate the motion from one spring to the other, and it must work through some rigid rod. The rod could be anywhere or it could be a series or a plate. It could be anywhere between the two extremes, from the top of the shackle to the bottom.

Q. Without changing the principle of the operation?
A. It would not be changed in the least.

Q. What would be the difference in effect, if any, were the links or shackles more in a line with the springs in "Defendant's Exhibit B"?

Objected to.

A. If these shackles are nearer parallel with the spring, a certain pressure on the spring tending to elongate it, a definite amount will be communicated through the connecting rod so that its torsion will be less in communicating this motion to the other spring if it is at an angle nearer the horizontal than if it is perpendicular. I am quite sure that is the case. I have not thought of it before. If I press this spring so as to elongate the spring an eighth of an inch, to make up for that eighth of an inch elongation this link has to move through a greater angle than if it is perpendicular.

Q. It falls more?

A. It falls more to take up the motion of an eighth of an inch of elongation of the spring. We will say the torsion of the
83 connecting rod is a constant amount in either case. If there is a hundred pounds weight here it gives a certain torsion to this rod. If, then, this is nearer horizontal a greater movement is required to take up the eighth of an inch elongation; but it is the same torsion. Consequently it would communicate the motion to the other side to a better advantage than if it was in a perpendicular. I think, from a strictly mechanical standpoint, that would be the explanation that applies to it.

Q. Suppose the connecting rod were not horizontal, but was curved up in the center two or three inches?

(Objected to.)

A. It would make no difference whatever.

Q. It would make no difference in its operation?

Objected to.

A. No difference whatever; no, sir. It simply is a rod to communicate motion from the shackle on one side to the shackle on the other side. Its shape has nothing to do with it. It is simply the torsion that must be overcome as far as possible; so rigidity is all that is required.

Cross-examination by Mr. SHERMAN:

Q. The devices shown in the models you have been speaking of are very clearly shown in them, are they not?

A. They are; yes, sir. It is very plain.

Q. And anybody who examined them and compared them could tell whether the devices are substantially the same, could he not?

A. It would seem that it was evident to an ordinarily intelligent man.

Q. And the judge who tries this case, or the attorneys who try this case, could see just as clearly, other things being
84 equal, as you or any other expert can?

A. It would seem to be self-evident.

Q. So that there is nothing at all intricate about them?

A. No, sir.

Q. The devices that are intended to be shown are devices the working of which is plainly to be seen on inspection?

A. It would seem very evident.

Q. Have you seen the device shown in "Defendant's Exhibit B" in operation in a buggy or wagon?

A. No, sir; I never have.

Q. Have you ever seen the patent?

A. Yes, sir.

Q. Have you compared the specifications, claims, and drawings of the patent with the model as made?

A. Yes, sir.

Q. And that is a true model, made from the drawings of the patent?

A. I do not see anything in principle that differs from it in the least.

Q. Is that a faithful copy in wood and iron of the drawings shown in the patent and as claimed in the patent?

A. The drawing in the patent does show this nearer perpendicular in a small- degree than is shown in this model.

Q. How about the relative proportions of the different parts?

A. I notice no difference except this, which would be eliminated by putting a weight on the spring.

Q. Have you examined to see whether the height of the C-shaped jacks and the length of the bar or shackle correspond proportionately with the length of the model as shown?

85 A. That had not entered my mind; no, sir.

Q. Have you ever built any machinery from drawings?

A. We work entirely by drawings.

Q. Is it not a fact that frequently if you change the proportions of the machine built from the proportions, as shown in the drawings, the machine itself does not work effectively?

A. It is a positive fact regarding the building of machinery, but not patent drawings. We never make patent drawings to scale.

Q. I am speaking of drawings such as you use.

A. There are many things where a little would govern everything in a machine, and it must work exactly to the drawing. Figures are set down that must be followed.

Q. Is it not true that where you do not follow the figures and the drawings in constructing a device or a machine the working is ineffective at times?

A. We do not try it that way. We always follow them.

Q. Is it not a fact that it would be frequently?

A. Certainly; yes, sir. Drawings must be followed or they would be of no use in constructing machinery.

Q. Suppose you had a device which upon simple, careless inspection you might say was constructed according to certain drawings and it worked in a certain way, and you discovered that the proportions shown in the drawings — when you came to measure them and compare them, could you say that the device as made would work exactly as the device which is shown in the drawing itself?

A. That would depend entirely on the device. Of course,

86 in some cases, it would make no difference; in others it would be vital; but we make a great deal of machinery where we

cannot vary it a hundredth of an inch. It must be exactly right and we cannot vary a tooth in a gear, not one in a thousand, and on other things we simply make chalk drawings.

Q. Look at "Defendant's Exhibit B" and state whether you find in that model a rod having hubs formed upon it, which have arms as a part of the same, in combination with the ends of the half springs.

A. I find the rod here with four hubs formed upon it in combination with the end of the spring.

Q. The hub having two arms?

A. The hub does not have two arms.

Q. In combination with a half spring?

A. With a half spring.

Q. You do not find all those elements there, then?

A. In this construction there are not two arms that are attached to this rod.

Q. Do you find a combination of a connecting rod provided with two arms at each end, combined with a half-elliptic spring?

A. Yes, sir.

Q. You find that?

A. If I may count this part that is put in separately, it is merely a matter of construction. In the case of "Complainants' Exhibit A" there are two that are put on separately. In "Defendant's Exhibit B" one of the arms is welded on and the other is attached separately.

Q. I will assume that "Complainants' Exhibit L" is a combination consisting of a connecting rod turning in bearings that are
87 fastened to the axle or the bolster, having firmly secured to it a hub with two arms, provided with bolts at the outer ends of the arms, and a half-elliptic spring on each side secured by these bolts to the arms of this hub. I will ask you whether you find that combination in the model "Defendant's Exhibit B."

A. In "Complainants' Exhibit L" I find two links of malleable iron driven onto an iron shaft. In "Defendant's Exhibit B" I find one of these links forged onto the iron shaft and the other one held on by pins.

Q. Now, answer the question whether you find that particular combination of elements.

A. In principle, you mean?

Q. No; I mean that particular combination that you see in "Complainants' Exhibit L." I wish you to state yes or no whether it is contained in "Defendant's Exhibit B."

A. No, sir; the combination is not just the same, but the difference is in construction and not in principle.

Q. What element that you find in "Complainants' Exhibit L" is wanting in "Defendant's Exhibit B," and what is substituted for that wanting element or those wanting elements in "Defendant's Exhibit B," if anything?

A. If the principles of this invention were explained to two different draughtsmen one would design it in the manner shown in "Defendant's Exhibit B;" another might design it in the manner

shown in "Complainants' Exhibit L." It is simply a matter of construction, not of principle.

88 Q. What I want to know is what element is that combination, "Complainants' Exhibit L," is wanting in the combination or device "Defendant's Exhibit B"?

A. Perhaps this will answer you, then: In "Complainants' Exhibit L" the two links are cast together and driven on the rod. In "Defendant's Exhibit B" one of the links — forged on the rod and the other attached to it by pins. That is a substitute for the other.

Q. Now, take the "Defendant's Exhibit A," which I assume consists of the combination of the connecting rod, the two arms formed one on each end of it, and the springs secured by bolts to the end of the arm, and what element of that combination is wanting in "Defendant's Exhibit B," and, if any element is wanting, how is it supplied, if at all?

A. I do not see that any element is wanting in the model "B" that is shown in the model "A," if I understand your meaning of the word "element"

Q. It means a part of the device—not its equivalent, because that is not the same thing in patent law.

A. It is as near the same as two designers would make the same thing if explained to them without models—that is, the principle would be embodied in each.

Q. I wish you would separate the principle of these devices from the separate devices that carry out the principle and effect the common purpose of all, if there is any common purpose in all of them.

A. I should say that in defendant's model "A" the two links on each end of the connecting rod are made separately and driven onto their positions. In defendant's model "B" one of those links

89 or its equivalent is forged on the rod and the other one is put in place and held by bolts.

Q. You have read the Stringfellow and Surles patent, covering the device shown in "Defendant's Exhibit B"?

A. Yes, sir.

Q. State what you find in that patent describing that device to show any device for equalizing the motion of the springs.

A. I find nothing. He evidently builded wiser than he knew.

Q. There is nothing in the patent?

A. I think not. I think he makes no claim for it; but the strong point in this patent, as it appears to me, was this rigid connecting rod.

Q. For what purpose does he use that?

A. I have forgotten how he states it. I can see the effect without it. It would be very serious in a construction of this kind. His purpose, as stated here, which is a very evident one in the model, is so that the carriage in going over uneven places will have the load so distributed that it will avoid shaking, so to speak.

Q. Is that the object he states that these rods are used for?

A. Yes, sir. I will read you one sentence. He says: "And that when the vehicle is moving over rough roads the shackle bars will allow the body of the carriage to have a free and easy swinging

motion, which will counteract all unpleasant and injurious jars to the carriage body and carriage parts; at the same time the long springs D D will allow the carriage body to have an easy, elastic motion." In fact, by cutting off this connecting rod in model "B," this is an old device. By cutting off this connecting rod in model "A," this is the common device in use.

Q. What does he say about the rod?

90 A. His principal definite point is that they serve as lateral braces or ties for the springs.

Q. Is not that the only purpose that he states those rods are for?

A. That is the only purpose that he states they are for; but then he gives the effect of them afterward in this freedom from sideways motion as one wheel would pass over a stone.

Q. Then, when you say that those are used for the purpose of equalizing those springs you state it not from anything that the patentee claims, but from something you think you see in the device itself?

A. Yes, sir; exactly. He did not know all that he did in the invention.

Redirect examination:

Q. State what the character of the substitute that you mentioned in your cross examination is in "Defendant's Exhibit B" for the device embraced in "Complainants' Exhibit L."

Objected to.

A. In "Complainants' Exhibit L" the two links forming the shackle bars are cast together of malleable iron and driven on the connecting rod. In defendant's model "B" one of the links is forged on the connecting rod, and the other held on by bolts and rivets.

Q. State whether the one subserves the same purpose as the other.

Objected to.

A. It does, exactly; and I will incident-ly remark that were this connecting rod in model "B" at the upper end of the shackle bars, as is the case in "Complainants' Exhibit L," there would be

91 no apparent difference to an inexperienced mind, and there is no difference now from a mechanic's standpoint; but still it looks at first sight as though one was made different from the other, whereas the principle is exactly the same, whether that is in the middle or at top or bottom or raised a foot above.

Q. Will you examine patent "Exhibit C," from which defendant's model "B" was made, and say whether the construction, as shown in the drawings of said patent and made in exact proportion therewith, would, in your opinion, operate any differently from that shown in defendant's model "B"?

Objected to.

A. It would operate in no different way, except as I explained in a former answer. The nearer horizontal this is, the greater motion is given by a due weight on the spring, and the torsion through this connecting rod would be the same; consequently it would more nearly uniformly transfer the motion from one side to the other if it were nearer horizontal, simply because in each case the torsion to the rod is the same, while the angular movement is greater in the first case than in the last.

Q. Suppose they are lengthened and hang in the same position, how would that affect its operation? Suppose these C-shaped jacks were higher?

A. It would not be changed.

Q. Then, if you should change the jacks it would make no difference in its operation?

A. It would make no difference.

Q. The principle would be the same?

A. The principle would be the same.

92 Q. Examine "Complainants' Exhibit L" and state whether the device has been in use for any number of years; and, if so, how long, for any purpose.

A. You refer to this rod being driven on through square holes?

Q. Yes.

A. The device, of course, for other things than carriages, is very old; but I have not examined carriage gears enough to say whether it is new on carriages or not; but the principle is what is used every day. It is as old as the hills.

Q. As old as mechanics?

A. Yes; in fact, it is the best and strongest way of fastening one piece to another, to drive in square holes.

Q. It is in common use?

A. Certainly; yes, sir.

Recross-examination:

Q. Suppose that these C-shaped jacks were double the height, and the end of the spring occupied the same position that it does now and the link was doubled in length, what would be the effect upon the ease or difficulty of equalizing the springs?

A. The movement would be just the same in each case, but with the same sized rod here there would be greater torsion in the second case. That should then be increased proportionately, because these levers are elongated.

Q. Suppose it was not, then what effect would it have upon the opposite spring?

A. The tendency would be to reduce the effect that the pressure would have; but if this connecting rod was enlarged sufficiently—that is, proportionately—then the effect would not be changed

93 at all. To explain further, if I should take that rod in my hands I could twist it a little, but if it was two inches long I could not twist it as much.

Q. What would you say as to whether the device shown in "Complainants' Exhibit A" is or is not an improvement over the device

shown in "Defendant's Exhibit B" to accomplish the same purpose?

Objected to.

A. It is a better construction. The improvement is one of proportion and construction.

WORCESTER R. WARNER.

Whereupon the further taking of depositions was adjourned, by consent, until January 27th, 1885, at 10 o'clock a. m.

94 LUDWIG HERMAN, of lawful age, being by me first duly sworn, as hereinafter certified, deposes and says as follows:

(Judge HALE:)

Q. State your name, age, place of residence, and occupation.

A. Ludwig Herman; age, forty-two; residence, Cleveland; occupation, general manager of the Buckeye Machine Company.

Q. Please state fully the experience and education you have had in the examination and construction of machinery.

A. I am a graduated mechanical engineer; graduated in 1861. I have had about twenty or twenty-two years' practical experience as engineer, employed in different establishments; have had charge of some of the largest concerns in this country—bridge works and machine factories.

Q. Have you examined the letters patent granted to complainants Topliff and Ely, being "Exhibit K" attached to complainants' deposition, No. 122,079; also the two reissues?

A. Yes: I have examined them.

Q. And do you understand the alleged invention and claims made in each of those?

A. Yes, sir; I do understand them fully.

Q. Will you state what, in your opinion, is described and the claims made in each of those letters patent and reissues?

Objected to.

A. I have examined the original patent, dated December 17, 1871. I find that in the description there is mentioned a construction for the purpose of equalizing the action of one spring with the other, or to transmit the up-and-down motion produced on the spring by the load to the other spring. I find also that while that is
95 stated in the description, the claim reads that the purpose of the construction is only to equalize the action of the ends of the same spring, not acting from one spring to the other at all. In the first reissue the description is materially the same, and the claim is the same as in the first claim, only the action on the ends of each spring. In the second reissue is the same description, and here there is a claim of a connecting rod for the purpose of forcing both springs up or down in unison with each other. I find that the whole patents show the intention to patent a construction for the

purpose of making both springs act in unison with each other under any load.

Answer objected to.

Q. Have you examined the letters patent issued to John B. Augur, No. 108,085, dated October 11, 1870?

A. Yes, sir; I have examined them.

Q. State what you find to be the description of the improvement and claim there made.

Objected to.

A. I find in the description that, besides a fifth wheel, which has nothing to do with this case, there is an arrangement of half-elliptic springs, with links and a cross-rod, precisely the same as in the other case and for the same purpose. In the claims here it says that there is an equalizing action on the springs of vehicles, distributing the weight of the load, and it is accomplished by "a combination of pivoted links with a rod connecting the same, the rod compelling both links to move in unison, as and for the purpose described." That is the identical claim of the patents I examined before.

Answer objected to.

96 Q. Have you examined the letters patent issued to Stringfellow & Surles, No. 31134, dated January 16, 1861?

A. Yes, sir; I have examined them.

Q. What do you find to be the description and claim in that patent?

Objected to.

A. I find the description in this patent to describe members or parts which are identical in construction with the parts of the Topliff and Ely patents. I find that there is a slight variation between this claim and the other, but the effect of the construction I find is the same.

Answer objected to.

Q. Will you examine "Complainants' Exhibit A" and "Defendant's Exhibit B" and point out fully what, in your opinion, are the similarities or differences in the two models in construction, operation, and object attained by each?

Objected to.

A. I find in both cases a wooden frame representing the running gear of a buggy or vehicle. Attached thereto I find also in both cases supports or clips which serve as bearings for a transverse rod. This rod is provided with shackles or links. Attached to these shackles I find elliptic springs or half-elliptic springs. The parts in both cases are the same in number, the same in kind, the same in construction. The only difference, if any, is the relative proportion of the parts to each other, and the transverse rod in "Exhibit A" of complainants is straight, while in "Exhibit B" of defendant

I find this transverse rod to be deflected or bent. The operation of the different parts I find to be perfectly identical.

97 Q. What effect, if any, has the bending of the rod upon the operation or the object produced?

Objected to.

A. The action of a rod connecting two parts is entirely independent of its shape. It would not matter if that rod was bent down or bent up or of an S shape or any other shape; as long as the fulcrums or the parts around which the rod moves are in a straight line the action of the rod will be the same, entirely independent of its form.

Q. What effect has either of these connecting rods as shown by the models to which your attention has been called in equalizing the pressure upon the springs?

Objected to.

A. The half-elliptic springs in both these cases are connected to each other by the use of links and transverse rods. The effect of these links and transverse rods will be that in case one of those springs is depressed by a load or otherwise the motion of the end of that spring will, by means of these transverse rods and links, transmit it to the other spring and cause that other spring to be deflected in the same way and manner as the spring loaded.

Q. What difference do you find, in your opinion, in the two in producing the effect described?

Objected to.

A. I do not find any difference in producing the effect. The effect is identical, produced by the same means and in the same way.

Q. Having a carriage constructed with springs connected by rods as shown in "Complainants' Exhibit A," what changes, if any,

98 would have to be made to construct a carriage with springs connected as shown in Respondent's "Exhibit B"?

Objected to.

A. In order to make both perefctly identical these supports, or stands, or clips, as I might call them, in "Defendant's Exhibit B" would have to be straightened out and the links, which in this case are united in the center, would have to be cut in two and this transverse rod would have to be straight. Those are all the changes that would have to be made.

Q. Would that change the principle upon which both are constructed or upon which either is constructed?

Objected to.

A. That would not change the principle at all.

Q. What difference, if any, would it make whether the connecting rod is higher or lower from the axle than is shown in "Defendant's Exhibit B"?

Objected to.

A. The position of the rod has no effect upon its action. The rod is only supported from the frame, and if it is a few inch-s further away from the frame or closer to it it would not have any effect on its action.

Q. Examine "Complainants' Exhibit L," describe its construction, and state what new principle is involved in it, if any.

Objected to.

A. I find here a rod. Attached thereto I find a couple of levers or links, united by a hub. The same hub is cast in one piece with both arms. This hub is driven apparently onto a square shoulder on that rod. The levers are intended, I suppose, to connect other parts with. That is all I find here. I do not see anything new in that. They are parts that I have seen used for a great many
99 purposes. It is nothing but a rod used as shaft or fulcrum and a couple of rods attached to it. It is an element that is used every day in mechanics. The principle is very old.

Cross-examination by Mr. SHERMAN:

Q. In the description and drawings of the Topliff & Ely patent and the Augur patent there is nothing but what is clear and plain that anybody could understand, is there?

A. It depends on who the anybody is.

Q. Anybody with ordinary understanding.

A. Well, I don't know about that.

Q. There is nothing doubtful about them, is there?

A. There is nothing doubtful about them, no, sir.

Q. You take a man of ordinary intelligence who has had experience in building machines or other devices and he would have no difficulty in seeing what was meant by that description and those drawings, would he?

A. I suppose a man that was educated up to know something about mechanics could understand them.

Q. Would not any ordinary man, whether he had had any special education in mechanics or not, understand from those drawings and from that description what was intended to be built and how that device was intended to operate?

A. It would depend very much on who the ordinary man was.

Q. I say a man of ordinary understanding.

A. The common run of men would not understand it. My experience is that the common run of men does not know much.

Q. Then you say that those patents contain descriptions and drawings that are so blind that an ordinary man would not
100 understand what was meant by them?

A. It would depend entirely on who the ordinary man is.

Q. Answer my question. A man of ordinary intelligence would not understand what was meant by them?

A. Won't you please qualify your "ordinary man"?

Q. A man of ordinary intelligence, then.

A. No; I do not think a man of ordinary intelligence, as the general run of men is, would understand a patent description—any, not this only.

Q. Then you do not limit it to this patent?

A. No; any patent.

Q. Take a man of sufficient intelligence to understand a description and drawing for common devices in patents. I will ask you whether he would understand this.

A. Yes; any man that is trained up to it will understand it.

Q. How much training and what kind of training would you say that it was necessary for a man to have to understand the description contained in the Topliff patent and know what that device was for?

A. How much training would depend upon the individual. The kind of training would be such as any mechanic that is used to work from descriptions or drawings would possess.

Q. Then I understand you to say that a man who is not used to working up machinery or devices from patent drawings would not understand the description in that?

A. I did not say patent drawings. I said drawings. My experience is that men that are not trained up to work from drawings cannot work from them.

Q. I am not asking about the man's ability to build the
101 machine, but to understand what is meant by those descriptions and the drawings, and what that device as described there is used for.

A. A man that understands drawings will readily understand it.

Q. A man that does not understand drawings does not understand it?

A. No.

Q. What is there in "Complainants' Exhibit A" and "Defendant's Exhibit B" that a man of ordinary intelligence would not understand the difference between the two on examining them?

A. Now, you are going to actual construction. A man who can understand construction is not necessarily one who understands drawings. In those exhibits I think anybody will see the similarity.

Q. So that it does not require a trained mechanic to distinguish differences and to understand the construction of these two models that you have in your hands?

A. It will not take a trained mechanic to understand that there is a perfect similarity in action.

Q. Any person of ordinary understanding could understand that?

A. Yes.

Q. I understand you to say that in the Stringfellow patent the specifications describe parts of the device as identical in construction and operation with the parts contained in the Topliff & Ely and Augur patents; am I right?

A. Yes, sir.

Q. And that the effect in both devices is the same?

A. Yes, sir.

Q. I understand you to say that in the Topliff & Ely and Augur patents the expressed object of these devices was to equalize
102 the action of the springs; am I right?

A. Part of the Augur patent is the same with the Topliff patent. In my answer I stated that there were some other parts; but I said there are parts described which are identical.

Q. Will you take the Stringfellow patent and show where any claim is made in that patent that the device described there is intended to equalize the springs?

A. Here is one point: "The parts are also so braced and strengthened that all liability to twist the carriage body is effectually prevented." The carriage body will not be twisted if one side of it would have an independent motion from the other. If that independent motion is hindered so that both sides have to move at the same time that is the prevention of a twisting motion. Here is another part: "In uniting the shackle bars to the ends of the springs D D and the supports C C C′ C′ the two tie-bars G G with forked ends, one of which is shown in figure 2 of the drawings, are used for the purpose of bracing the supports C C′ and also the ends of the springs D D, so as to prevent the swaying of the carriage body from twisting or bending the supports C C laterally."

Q. As a mechanic, when you find that a certain part of a machine is constructed to brace other parts from twisting laterally do you construe that to mean any sort of a brace to prevent its moving in any other direction?

A. I think you are not correct in that point. We spoke here about a twisting motion, and later we spoke about lateral movement. That twisting motion and that lateral movement are two distinct points.

Q. Read that again, "So as to prevent the swaying of the carriage body from twisting or bending the supports C C laterally."
103 Is that the phrase?

A. That is one of the phrases, but there is another phrase before that.

Q. Then these two phrases that you have read are the only phrases in the letters patent, are they, that indicate an intention to equalize the springs?

A. Well, there is a disclaimer and a claimer here—"We are aware that side springs have been used attached at near their ends to the ends of C-formed springs or rigid or stiff supports by means of jointed links so that the carriage body will have a longitudinal motion, of the side springs, and we do not claim such as our invention. But what we do claim as new and desire to secure by letters patent is the transverse ties G G, arranged and operating substantially as and for the purposes specified." And one of the purposes specified in this case is the prevention of a twisting motion in the body of the carriage.

Q. Those are the only phrases you find in the patent that indicate to your mind that there is an idea or an intention to equalize the springs?

A. The only phrases that you have reference to making both springs move in the same way.

Q. Look at the patent again and see if you find in it these words: "In uniting the shackle bars to the ends of the springs D D and the supports C C C′ C′ two tie-bars G G′." Are those two tie-bars shown in this model, "Exhibit B"?

A. Those bars are shown.

Q. The tie-bars G G are this rod connecting these two springs, are they?

A. Yes, sir.

104 Q. "With forked ends, one of which is shown in figure 2 of the drawings, are used for the purpose of bracing the supports C C′, and also the ends of the springs D D, so as to prevent the swaying of the carriage body from twisting or bending the supports C C′ laterally?

A. Yes, sir.

Q. Then, as a mechanic, according to the patent, you would say, would you not, that these tie-bars, having forked ends, are used only for the purpose of preventing this lateral twisting motion?

A. The lateral and twisting motion.

Q. These tie-bars are used as a brace between the springs to prevent any lateral twisting?

A. Any lateral twisting of the carriage body?

Q. What do you call the bearings in the tie-rods shown in "Exhibit B"?

A. The bearing on that rod is in this arm, where the pin rests. A bearing is a hole wherein a pin moves.

Q. To make both carriages, one constructed as "Exhibit B" and the other as "Exhibit A," identical you say that you would be required to straighten out the C-shaped supports?

A. Yes, sir.

Q. You would cut the links in two, you say?

A. Yes, sir. There are actually two eyes in these links, top and bottom, and those two eyes are connected the entire length. If I should cut that in two I should get the two links precisely as shown in "Complainants' Exhibit A."

Q. You would have to cut these two links in two?

A. Yes, sir; longitudinally.

Q. What else would you have to do?

105 A. I would have to straighten out this cross-bar.

Q. What would you do with these arms?

A. Have to straighten them out.

Q. And what else would you have to do to make the two alike?

A. I think that is all.

Q. After you had cut this link in two and straightened out the C-shaped springs and straightened out the rod how would you attach the springs to the rod to make the springs equalize one another?

A. Just as I have described it, by straightening out this bar.

Q. Then you would have a straight bar?

A. Yes, sir.

Q. What would you do then?

A. That would be the end of it. That is all that I would do.

Q. How would that equalize the springs?

A. By means of that rod.

Q. Does it not require to be fastened to this link in some way?

A. It is fastened now, and would remain fastened.

Q. Simply by that pin?

A. Certainly. That pin is part of this rod now, and would remain part of it.

Q. In case you cut this link in two in seeking to make the two machines identical, it would leave but a single link there, would it not?

A. No, no; that would make two links, just the same as they are in the other case.

Q. I thought you said you would cut them in two.

A. I did not say I would throw one away. I said I would just cut them in two, but not to throw one away.

106 Q. Let me ask you if the device as shown in "Defendant's Exhibit B" contains a combination of a connecting rod, two links secured to the bar and a side spring?

A. Yes.

Q. I see only one link there.

A. I see two links here united, just the same as you have them united in "Complainants' Exhibit L."

Q. Mechanically speaking, those are two links?

A. Mechanically and theoretically speaking, there are two links. They are grown together.

Q. In "Defendant's Exhibit B," then, you have a single link, do you not, with a double eye?

A. Yes, sir; a double eye at each end. But that is identical with two links.

LUDWIG HERMAN.

107 GEORGE J. WARDEN, of lawful age, being by me first duly sworn as hereinafter certified, deposes and says as follows:

(By Judge HALE:)

Q. State your name, age, residence, and occupation.

A. My name is George J. Warden. I will be fifty years old in April next. I live at 35 Linden street. My business is at 1217–1221 Euclid avenue. I am a carriage-maker by trade.

Q. How long have you been in the business of carriage-making?

A. I have been in the c-rriage business thirty-three years altogether.

Q. Manufacturing all the time?

A. Yes; not individually. I worked, of course, as a mechanic for different parties, and as a general foreman and manufacturer myself. I have been manufacturing myself for from nine to ten years.

Q. I- what branch of the carriage business, if any particular part of it?

Q. Suppose this goose-neck was raised higher; would that make any difference?

Objected to.

A. No, sir; not in the working of the spring.

Q. Nor in the working of the connecting rod?

Objected to.

A. No, sir.

Cross-examination by Mr. SHERMAN:

Q. In all your experience have you ever seen a carriage constructed like that ("Exhibit B")?

A. No, sir; I never have. I have seen carriages hung on goose-necks, but not in that way.

Q. I mean with all those parts complete.

A. No, sir; I never saw one.

Q. Are you able to state positively from an inspection of that model just how a carriage constructed like "Exhibit B" would operate?

A. Yes, I could tell how it would work.

Q. Would you say it would work successfully?

A. Not these days it would not; neither does that ("Exhibit A")—that is, in my trade. I speak of my trade in particular. There is work that is being built on that principle of "Exhibit B" to-day, but not with the rod. It is a level spring. It is hung on a thorough-brace. There are in the city to-day, or there were a short time ago, three such wagons, built with a goose-neck of this description, but not with the bar. They, of course, have the same motion to a certain extent that this does; and that is why I
112 think that would not be accepted to-day on account of that swinging motion.

Q. Does not that rod, constructed as it is in "Exhibit B," act chiefly as a brace and not as an equalizer?

A. I do not know what object the party had in putting it there. I do not know what object he would have in putting that bar there unless it would be for the purpose of equalizing. It might have been put there for a brace or an equalizer; I could not say as to that.

Q. Have you ever heard of the Stringfellow patent being used anywhere?

A. No, sir.

Q. You never have seen it in use yourself?

A. No, sir.

Q. How long did you use the combination shown in "Exhibit A"?

A. I cannot tell you that; I cannot remember; but I think since it first came out.

Q. That was in 1871, was it not, or 1870?

A. I cannot tell you anything about that; I cannot remember.

Q. Probably ten or twelve years?

A. More than that. I will tell you why. I have been away from Lowman for nine years last August 29th, and I was seven years with him as general foreman. Now, whether it was during my experience as general foreman or while I was ironing work I do not know. I never ironed this class of work myself; I was always on a different class of work.

Q. Do you know where you got the attachments?

A. No, sir; I do not. I understand at the time that we used those irons it was a patent of a carriage-maker by the name of Saladee.

113 Q. Do you find in "Defendant's Exhibit B" all the parts of the combination shown in "Complainants' Exhibit L"?

A. "Exhibit L" is the shape we get these bars in always.

Q. Do you find in "Defendant's Exhibit B" a straight rod, combined with a hub, containing two arms with eyes through which the springs are to be attached?

A. The hub, of course, is not there, but it is the same principle exactly. That ("L") is what we call the hub driven on; the other is not driven on, and is a different arrangement. Still it answers the same purpose. That is driven on there on a square. If it was driven on a round it would not work. The way it is put on, of course, makes no difference; the principle, it seems to me, is the same.

Q. I am asking whether the combination given you a moment ago is found in "Exhibit B."

A. Yes, sir.

Q. You find the exact combination—the straight rod, the hub, and the two arms with eyes?

A. I do not find the hub there, but the principle is there. It answers the same purpose.

Q. I am not asking you about the principles of these different machines now. I am asking you whether a certain combination that I have given you is found in this "Exhibit B."

A. The combination is there, but it is not put together as this is.

Q. Where in "Exhibit B" do you find the hub with two arms containing eyes through which the springs are to be attached?

A. The hub is not there, but that is the same thing, the principle is there.

114 Q. Look at Defendant's "Exhibit A" and state whether you find the combination of a straight rod, a hub with two arms having eyes through which the springs are attached in some way secured to the straight rod.

A. That is just the same as the other, so far as the principle is concerned. The hub is not there. I do not find that same combination, really, either in "Exhibit A" or "Exhibit B." The hub is not in either of them, but the principle is there, in both of them, of this rod.

Q. Look at "Defendant's Exhibit B" and state whether you find in it a straight connecting rod having at each end two shackles welded onto it, these shackles containing eyes to which the springs are attached.

A. No, sir; I find the straight rod. I find the eyes. I find the shackles, but they are welded together, but not as in "Exhibit A" or "Exhibit G," but it is the same principle exactly. That rod is separate, of course.

Q. You have not used or seen any carriage with a device similar to "Exhibit B," have you?

A. Not in use, no, sir.

Q. You cannot, then, state positively, of your own knowledge, whether the device shown in "Exhibit B" will have the same effect and operation in actual practice as the device shown in "Exhibit A," which you have been using?

A. I can say that it would.

Q. Of your own knowledge, I mean?

A. Yes, sir.

Q. Do you speak from knowledge?

A. I speak from practical knowledge.

115 Q. Where do you get that practical knowledge?

A. From the experience that I have had in the blacksmith shop.

Q. But you say you have never seen it in operation.

A. I have never seen it in operation, but I have attached the rods in different forms before now. I put on a set of these rods ("Exhibit G") or superintended putting them on about three or four weeks ago.

Q. When you say you have practical knowledge of the operation of a device when you never have seen the device in operation what do you mean?

A. I say that the principle is there.

Q. I am not talking about the principle. I am talking about your actual knowledge of a certain device which you say you never have seen in operation, and yet have positive personal knowledge of.

A. Yes, sir; I have, because I have attached this rod in all different shapes.

Q. Have you ever attached it just as it is attached in "Defendant's Exhibit B"?

A. No, sir; I have not.

Q. And yet you have actual personal knowledge of the operation of that that you have never seen?

A. Yes, sir; I think, sir, that that will work.

Redirect examination:

Q. In each of these exhibits, "A" and "B," do you find the same element or a substantial equivalent for the element?

Objected to.

A. Yes, sir; I find the same element, so far as the equalizing bar is concerned used for a particular purpose. The swinging

116 motion, of course, is not in "Exhibit A" that is in "Exhibit B." If the arms in "Exhibit A" were hung down long enough, the motion would be there also just the same. We always give them what we call a draw. We give them generally from a

half to three-quarters of an inch to prevent that swinging motion. That is why I say this would not be accepted to-day—because of that swinging motion. We guard against that.

Recross-examination:

Q. Practically what is the difference between the two in actual value for the purpose for which they are used?

Objected to.

A. I do not see any difference, so far as that is concerned.

Q. Put the two on the market together, and which would be the more valuable?

Objected to.

A. "Exhibit A" would be at the present time.

Q. As compared with the other, in that view, what would you say would be the difference in value between the two?

Objected to.

A. It would depend altogether upon whom it was for and what section of the country you put it in. There is just as much difference in carriages made at the North and the South as there is between light and dark and in the East and in the West. There is a difference in tracks. There is a difference in the get-up of carriages. Right here in Cleveland "Exhibit A" has the preference.

Q. As a matter of fact, the device shown in "Exhibit B" would not have any value here at all, would it, as a device?

A. Not with one in a thousand.

117 Redirect examination:

Q. I understand you to say that "Exhibit A" is not used very much?

A. It is not used very much; no, sir; not in my particular trade. I sold one a few days ago. The party would not have anything else but that. I went to Mr. Topliff and bought a set of these rods. I think I got them at his factory.

GEORGE J. WARDEN.
D.

Stipulations.

It is agreed between counsel that the depositions be taken in short-hand, and that when transcribed the notary may sign them for the witnesses respectively.

It is further agreed that the papers attached to and made part of the depositions as "Exhibit C," "Exhibit D," and "Exhibit E" may be used for all purposes for which certified copies of the letters patent of which they purport to be copies would be competent.

——— ———,
Counsel for Complainants.

——— ———,
Counsel for Respondent.

119 Specifications forming part of Letters Patent No. 130, whole No. 31134, dated Jan. 15, 1861.

To all whom it may concern:

Be it known that we, C. C. Stringfellow and D. W. Surles, of Lumpkin, in the county of Stewart and State of Georgia, have invented a new and improved mode of hanging carriage bodies; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

(Here follows diagram marked p. 118.)

Figure 1 is a side view of the improved mode of hanging carriage bodies.

Figure 2 is an end view of the rear parts taken in a transverse vertical plane, indicated by the red line *x x* in figure 1.

Similar letters of reference indicate corresponding parts in both figures.

This invention is a novel improvement in hanging carriage bodies on springs and from C-shaped jacks or supports, whereby the body is allowed a free and easy vibration longitudinally, and it is relieved from sudden and disagreeable jolts and jerks in traveling on rough roads or from the sudden starting of the horse. The parts are also so braced and strengthened that all liability to twist the carriage body is effectively prevented.

The invention consists in the combination of transverse tie-rods with the side springs, which are hung by shackle bars or jointed
120 links from C-shaped supports, as will be hereinafter fully explained.

To enable those skilled in the art to make and use our invention we will proceed to describe its construction and operation.

A A are the bolsters and B B are the perches of an ordinary buggy frame. C C are two front C-shaped iron loops or supports which are securely bolted to the side perches and over the bolster at the points where the bolster is connected with the perches, and C^1 C^1 are two rear C-shaped loops, which are similar to loops C C, and similarly secured to the rear part of the frame.

These C-shaped loops C C and C^1 C^1 are not springs, but serve as supports for the springs D D and the parts which are attached to and mounted on these springs D D.

On the overhanging end of each loop support C and C^1 is formed a transverse eye, *a*, which will be seen by reference to figure 2 of the drawings, through which eyes *a a a a*, bolts *b b b b*, are passed, which connect the upper ends of the shackle bars E E E E to the ends of the aforesaid loops and form joints which will allow the lower ends of bars E to swing back and forth in a direction with the length of the vehicle. The lower end of the swinging bars E (these bars being all of the same length) are jointed to the ends of the semi-elliptic springs D D by means of eyes *c c c c* on the springs and bolts *d d d d* in a similar manner to the joints of the bars E E with the supports C C^1.

STRINGFELLOW & SURLES

Carriage-Spring.

No. { 130. / 31,134 }

Patented Jan. 15, 1861.

Nos 220 v 277.
Taplift
Taplift Rel. } p. 118

Fig. 1.

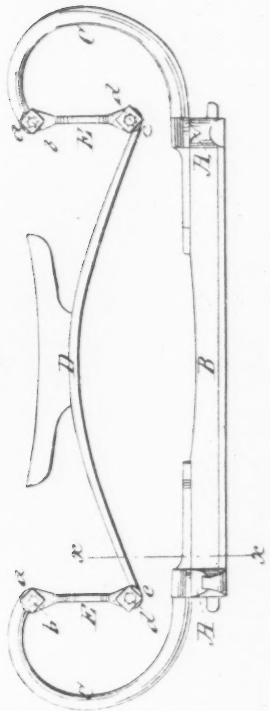
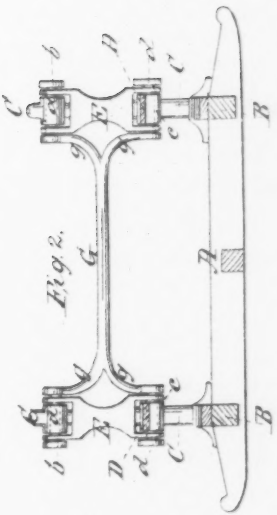


Fig. 2.



Witnesses:
J. W. Combs
R. S. Spencer

Inventor
C. C. Stringfellow
& W. Surles
per Munn & Co Attorneys

The two springs D D on which the body of the vehicle rests are thus suspended over the frame A B from the overhanging
121 ends of the stationary supports C C C^1 C^1, and these springs extend from the front to the rear supports on each side of the carriage body over the perches B B and a suitable distance above these perches.

It will thus be seen that the springs D D are suspended in such a manner from the four supports C C C^1 C^1 that the body of the carriage, which is mounted on said springs, will be allowed to have a free, swinging motion backwards or forwards, and in consequence of the springs being hung by the shackle bars E E E E the springs will also have an upward movement; in other words, the end of the springs in their longitudinal movement will describe circles concentric with the axis of their respective bolts *b b b b*. The longitudinal movement of the two springs D D will therefore be regulated by the length of the shackle bars E from joint to joint.

In uniting the shackle bars to the ends of the springs D D and the supports C C C^1 C^1, two tie-bars G G with forked ends, one of which is shown in figure 2 of the drawing, are used for the purpose of bracing the supports C C^1 and also the ends of the springs D D, so as to prevent the swaying of the carriage body from twisting or bending the supports C C^1 laterally. The forked arms *g g* of these tie-bars G G have eyes formed on their ends, and the length of the bars G is exactly equal to the spaces between the ends of the eyes *a a a a*, so that when the bars are properly put in place their eyes will receive the bolts *b b b b* and the bolts *d d d d*, and by means of these bolts and bars G are securely attached at the joints
122 of the supports C C^1 and to the end springs D D, so as to move with the shackle bars E and serve as lateral braces or ties for the springs D D and the supports C C C^1 C^1.

From this description it will be seen that when a load is put upon the two side springs D D the four sha-kle bars E E E E will hang perpendicularly over the bolsters or axles, and that when the vehicle is moving over rough roads the sha-kle bars will allow the body of the carriage to have a free and easy swinging motion, which will counteract all unpleasant and injurious jars to the carriage body and carriage parts. At the same time the long springs D D will allow the carriage body to have an easy elastic motion.

We are aware that side springs have been used attached at their ends to the ends of C-formed springs or rigid or stiff supports by means of jointed links, so that the carriage body will have a longitudinal motion of the side springs, and we do not claim such as our invention.

But what we do claim as new, and desire to secure by letters patent, is—

The transverse ties G G, arranged and operating substantially as and for the purposes specified.

C. C. STRINGFELLOW.
D. W. SURLES.

Witnesses:
S. S. CATCHING.
ROBERT W. WALTON.

124 UNITED STATES PATENT OFFICE.

ANSON C. STOWE, of San José, California.

Letters Patent No. 84316, dated November 24, 1868.

Improvement in Carriage-Springs.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, Anson C. Stowe, of San José, county of Santa Clara, State of California, have invented an improved carriage-spring; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention or improvements without further invention or experiment.

The object of my invention is to so connect the two side springs of a carriage that a weight placed on any portion of the carriage will depress each side equally, and prevent the strain to the springs occasioned by the frequent wrenching they are subjected to in getting in and out of the carriage.

The axle-bed and cross-bar of the carriage are connected by reaches, and have, at their ends, suspended by shackles, semi-elliptic springs, upon which the body of the carriage rests. Two shafts extend across from one reach to the other, one near each end, each having three bent cranks, one in the centre, and one at each end, the middle ones being joined by a connecting-rod. At each end of the carriage-bed is a bar, which passes from one side to the other, and both passing across on the same side of the shaft. The outside cranks of the two shafts are attached to the bars above by means of links, thus joining the whole together, and causing the slightest weight on one side to be equally distributed, causing a like depression of the springs on both sides.

To more fully illustrate and explain my invention, reference is had to the accompanying drawings, forming a part of this specification, of which—

(Here follows diagram marked p. 123.)

Figure 1 is a side sectional elevation of my improved spring.

Figure 2 is a plan.

A is the axle-bed, and B, the cross-bar of a carriage, connected by the reaches C C.

Semi-elliptic springs, D D, are attached to the ends of the axle-bed and cross-bar by means of shackles *a a*. Upon these springs the body of the carriage is placed, bars *b b* forming across each end.

A. C. STOWE. 123

Carriage Spring.

No. 84,316. Patented Nov. 24, 1868.

Fig. 1

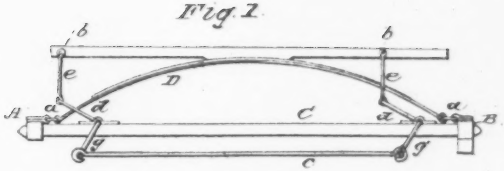
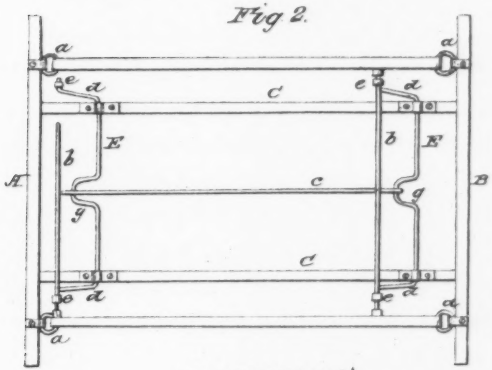


Fig 2.



Nos 220 & 274.
Tapliff
" Tapliffetal. } p. 123

Witnesses
Geo. H. Strong.
J. L. Boone

Inventor.
Aaron C. Stowe
By his attys
Drury & Co

In order to depress the springs of the carriage equally, I place across the reaches, one at each end, two shafts, E E, each of which is provided with three corresponding cranks, one, *g*, in the middle, and one, *d*, at each end.

The cranks, at the ends, are bent at right angles to the crank in the middle, and a connecting-bar, *c*, joins the two middle cranks.

The end or outer cranks are attached to the bars *b* above by means of links *e e e e*.

The arrangement of the parts is such that the two bars *b b* are both on the same side of the crank-shaft, so that the outer cranks, when no weight is brought to bear on the carriage-body, stand in a line with the reaches, while the middle crank stands perpendicular.

When a weight is brought to bear on any portion of the carriage, the spring on that side is depressed. This causes the links *e e* to depress the outer cranks, *d*, and cause the middle crank, *g*, to turn, thereby turning the cranks at the opposite end, lowering both springs simultaneously, the connecting-bar *c* aiding in operating the shaft at the opposite end of the carriage.

Having thus described my invention,

What I claim, and desire to secure by letters patent, is—

The shafts E E, with their cranks or bent arms *d* and *g*, and the connecting-rod *c*, together with the links *e e* and rods *b*, the whole operating on the springs D as an equalizing-device, substantially as herein described.

In witness whereof, I have hereunto set my hand and seal.

ANSON C. STOWE. [L. S.]

Witnesses:

GEO. H. STRONG.

J. L. BOONE.

127

UNITED STATES PATENT OFFICE.

C. M. SEXTON, of Aurora, Illinois.

Letters Patent No. 81217, dated August 18, 1868.

Improvement in Running-Gear for Wagons.

The schedule referred to in these letters patent and making part of the same.

To all whom it may concern:

Be it known that I, C. M. Sexton, of Aurora, in the county of Kane, and in the State of Illinois, have invented an improvement in wagons; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan of the bottom of the wagon.

Figure 2 is a side elevation, with the wheels and side of body removed.

Figure 3 is an end elevation, with the wheels and end of body removed.

My invention consists in an improved method of turning or cramping the rear, as well as front axle, and in a more perfect manner of suspending the body by springs, whereby the rocking and tilting experienced when ordinary springs are used are avoided, and ease and steadiness secured.

Letters of like name and kind refer to like parts in each of the figures.

(Here follow diagrams marked pp. 125 & 126.)

In the accompanying drawings—

A represents the wheels, B the front, and C the rear axle.

D represents a trussed support, resting upon the rear axle C, upon the top of which is a saddle, E, to which the body is hung.

The support D is connected at its outer ends with the front saddle, F, by two flat bars or braces, G, and in the centre by the reach H.

The front axle, B, is connected with the running-gear in the usual manner, while the rear axle, C, is divided in the centre, and each half attached to the outer ends of the support D by a bolt, *d*, which passes through the brace G, support D, axle C, and a small brace, *g*, forming a joint upon which each half of the axle turns.

Upon the rear end of the reach H is a double guide, *h*, each side of which is an arc of a circle, of which the joint *d* is the centre, in which the inner ends of the axle slide.

Attached near the inner ends of the axle C are rods, I, the front ends of which are coupled to the braces K by a bolt, *k*, which passes through a slot in the plates L, attached to the outer ends of the front axle B, allowing the ends of the rods to move laterally. The braces K are connected with the reach H, at *m*, by a bolt, upon which they turn.

The operation of this running-gear is as follows, viz:

In describing a circle with the wagon, the front axle is turned or cramped in the usual manner, the inner end pushing back the corresponding half of the rear axle by the rods I, while the opposite end pulls forward the other half of the rear axle, the adjustment of the plates L and braces K being such that lines radiating from the centre of the circle would pass through the centre lengthwise of the front axle and each half of the rear axle, so that the face of each wheel is at all times at a right angle to a line passing through the centre of the circle being described.

The rear wheels describe the same circle as the front wheels, so that the former will pass anything that the latter will clear, and enables this wagon to turn in less space than is required by others.

H represents half-elliptic springs, two upon each side, fastened to the body-frame by bolts through the centre of each, the outside ends of which are suspended from the saddles by hangers, O, while the inner ends are suspended by like hangers, *o*, to opposite ends of a strap, P, which passes over a pulley, Q, attached to the end of an equalizer, R.

2 Sheets. Sheet 1.

C. M. Sexton.

Running Gear.

No 81,217. Patented Aug 18 1868

Nos 220 x 274 Tapliff
Tapliff Val. } p. 125.

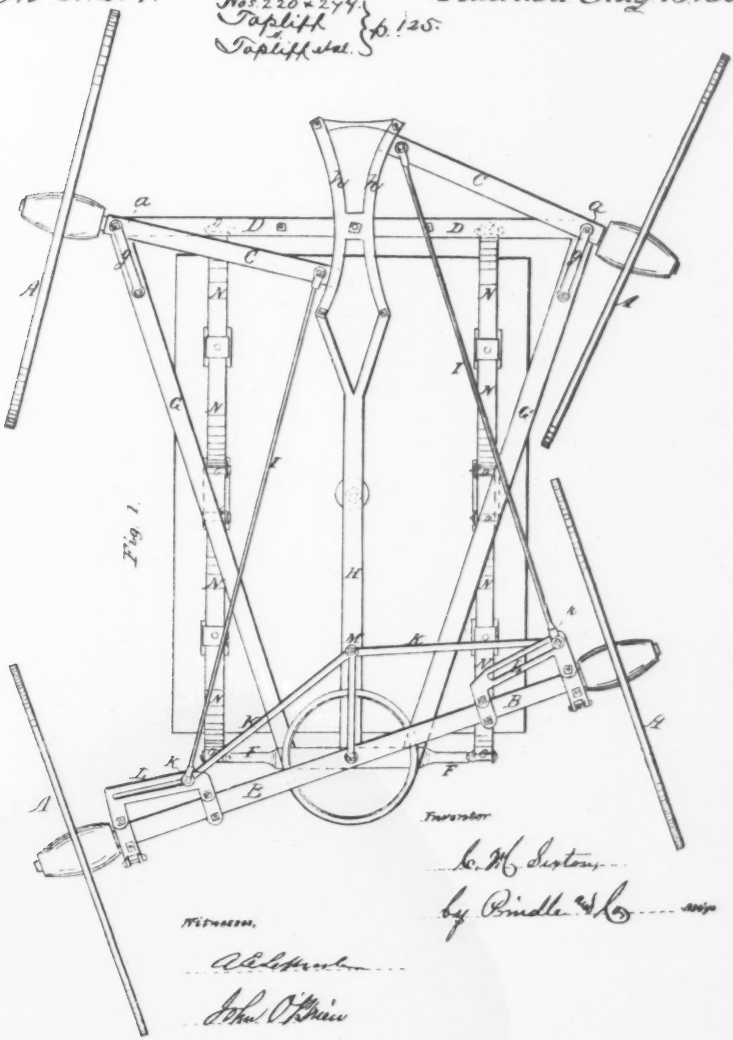


Fig 1.

Witnesses.

A. A. Lefferson

John O'Brien

Inventor

C. M. Sexton

by Bindle & Co Attys

2 Sheets Sheet 2.

C. M. Sexton,

Running Gear.

No. 81217. Patented Aug 18 1868.

Nos 220 & 277. Tapliff & Tapliff and } p. 126

Fig 2.

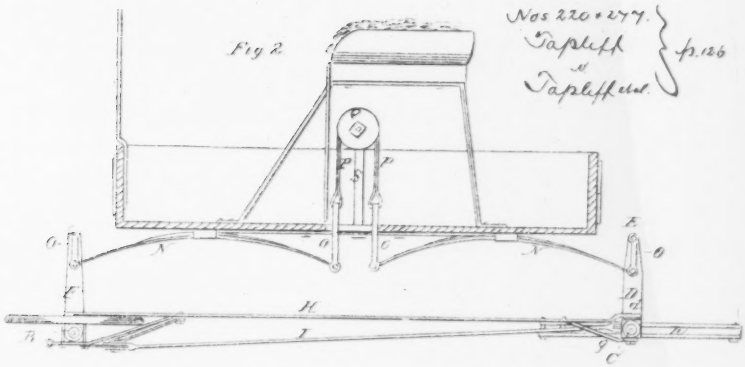
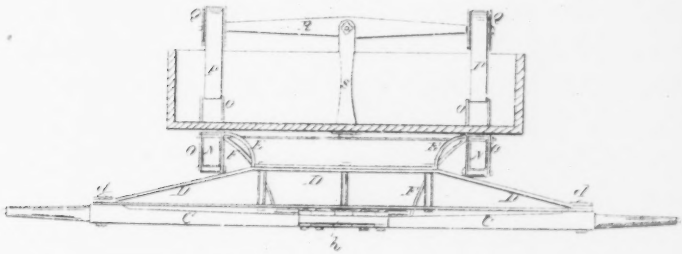


Fig 3.



Witnesses:

R. Edmonds

John O'Brien

Inventor

C. M. Sexton

by Brindle & Co Attys

S represents a support, secured to the body, at its lower end, by a bolt passing through the bottom, while upon its upper end is a clevis-joint, in which the centre of the equalizer R rests.

The equalizer is placed under the seat, where it is entirely out of the way.

This manner of suspending the body gives the greatest ease and comfort possible, as the shock received by one of the wheels is, by means of the straps, pulleys, and equalizer, distributed equally to each spring, so that the body retains a level position, regardless of the inequalities of the road, while the hangers allow sufficient end-motion to obviate the slight interruptions to a uniform rate of speed occasioned by passing over stones or other obstructions.

128 Having thus fully described the nature and merits of my improvement, what I claim as my invention, and desire to secure by letters patent, is—

The combination and arrangement of the divided axle C, double guide *h*, rods I, braces K, and slotted plates L, substantially as herein set forth.

I also claim the hangers O *o*, strap P, pulleys Q, equalizer R, and springs H, when constructed and used for the purpose substantially as herein specified.

In testimony that I claim the foregoing, I have hereunto set my hand, this sixth day of April, 1868.

C. M. SEXTON.

Witnesses:
D. C. PRATT.
A. MANN.

129 THE STATE OF OHIO, }
Cuyahoga County, } *ss:*

I, Henry J. Davies, a notary public in and for the county and State aforesaid, duly commissioned and qualified, do hereby certify that the above-named Isaac N. Topliff, Worcester R. Warner, Ludwig Herman, and George J. Warden were by me first sworn to testify the truth, the whole truth, and nothing but the truth; that the depositions above set forth were reduced to writing by me in short-hand by agreement of parties, and that by like agreement I have signed the names of the witnesses respectively to the depositions; that they were taken at the time and place in the caption specified; that I am not counsel, attorney, or relative of either party or otherwise interested in the event of this suit.

In witness whereof I have hereunto set my hand and seal of office this 10th day of February, 1885.

[SEAL.] HENRY J. DAVIES,
Notary Public.

Notary fees for taking and copying depositions, 150 folios at 15 cents, $22.50.

Deposition endorsed as follows:
4289. Topliff & Ely *vs.* Topliff. Filed Feb. 10, 1885. A. J. Ricks, clerk U. S. circuit court.

130 And afterwards, on the 11th day of February, A. D. 1885, the following replication was filed, to wit:

Circuit Court of the United States, Northern District of Ohio.

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF. } In Equity. No. 4289.

The replication of the above-named complainants to the answer of the above-named defendants.

These repliants, saving and reserving to themselves, now and at all times hereafter, all and all manner of benefit and advantage of exception which may be had or taken to the manifold insufficiencies of said answer, for replication thereunto say that they will aver, maintain, and prove the bill of complaint to be true, certain, and sufficient in law to be answered unto, and that the said answer of the said defendant is uncertain, untrue, and insufficient to be replied unto by *this* repliant-; without this, that any other matter or thing whatsoever in the said answer contained material and effectual in the law to be replied unto and not herein and hereby well and sufficiently replied unto, confessed and avoided, traversed or denied, is true; all which matters and things these repliants will be ready to aver, maintain, and prove as this honorable court shall direct, and humbly pray as in and by the said bill they have already prayed.

SHERMAN & HOYT,
Solicitors for Complainant-.

131 Endorsed: United States circuit court, northern district of Ohio. In equity. No. 4289. John A. Topliff & George H. Ely *vs.* Isaac N. Topliff. Replication. Filed Feb'y 11, 1885. A. J. Ricks, clerk. Sherman & Hoyt, solicitors for complainant-

And afterwards, on the 12th day of February, 1885, the following motion was filed, to wit:

United — Circuit Court for the Northern District of Ohio, E. D.

JOHN A. TOPLIFF and GEORGE H. ELY, Partners, &c.,
vs.
ISAAC N. TOPLIFF. } Motion.

The defendant now comes and moves the court for leave to take further evidence in said cause, for the following reasons:

That plaintiffs, in taking their testimony in reply to testimony of said defendant tending to show that the plaintiffs' patent was of an article that had been long previously thereto patented (and in public use) by one —— ——, gave evidence for the first time tending to show, and upon a claim not before made, that to obtain the same tortion strain on the crank rods shown in the models attached to the depositions of the defendant as is obtained by plaintiffs' patent it

would have to be from six to seven times as large as in the patent of plaintiffs.

The defendant says that since said testimony of the plaintiffs was taken he has caused experiments to be made by competent experts to test the truth of said claim and testimony and ascertains the same to be entirely untrue.

BOYNTON & HALE,
Sol'rs for Def't.

132 Endorsed: 4289. Topliff & Ely *vs.* Topliff. Motion for leave to take further testimony. Filed Feb. 12, 1885. A. J. Ricks, clerk U. S. circuit court. Boynton & Hale.

And afterwards, on the 13th day of February, 1885, the following order was entered upon the journal of the proceedings of said court, to wit:

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF. } Chancery. No. 4289.

In this cause, on application of the defendant, it is ordered that he have leave within one week to take evidence upon the point set forth in his motion filed Feb'y 12th, 1885, and that the complainants have one week within which to reply.

133 And afterwards, on the 19th day of February, 1885, the following deposition was filed, viz:

In the Circuit Court of the United States, Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF. } No. 4289.

Depositions taken before me, A. C. Dustin, a notary public within and for the county of Cuyahoga, in the State of Ohio, at the office of Messrs. Sherman & Hoyt, at Cleveland, in said county, on the 5th day of February, to be read in evidence on behalf of the complainants in the above-entitled action.

Present on the part of the complainants, Henry S. Sherman, Esq.; present on the part of the respondent, Hon. Jno. C. Hale.

ALEXANDER E. BROWN, of lawful age, being by me duly sworn, as hereinafter certified, testified as follows:

(By Mr. SHERMAN:)

Q. State your name, residence, and occupation.

A. Alexander E. Brown; 40 Kennard street, this city; I am a civil mechanical engineer, and my business at present is vice-president of the Brown Hoisting & Conveying Machine Company.

Q. State whether you have had any experience as a practical mechanic. And, if so, for how long?

A. Since I graduated at the Polytechnic Institute, in Brooklyn, New York, in 1872, I have had to do with mechanical de-
134 vices, both designing, constructing, and manufacturing, and at the present time and for the last four years I have given almost my entire time to that branch of business.

Q. Where?

A. Here in the city; both in machinery and engineering construction.

Q. I wish you would examine Defendant's Exhibit A and Defendant's Exhibit B and state in what particulars these two models differ one from the other, if in any—that is, in the principle or operation of the devices.

A. Taking Exhibit B first, I see it consists of two springs, half-elliptical, I believe they are called, for the support of the body, supported by C-shaped jacks. The shackles or link connections are hung from the C-shaped jacks and the springs connected with the lower ends of the links, and a rod connecting these shackles or links. Now, the three elements that compose the working parts of this Exhibit B, leaving the C-shaped jacks out, are the springs, the shackles, a connecting bar or crank pin or beam, and the pivots to which the springs and the shackles are suspended. Exhibit A also has half-elliptical springs, but they are connected by pins to the lower ends of cranks suspended from a shaft resting in bearings or boxes or journals on the carriage frames. These cranks are tightly keyed or welded to this shaft, the shaft performing only the functions of a shaft in this—it connects the two cranks.

Q. What is its functions?

A. Its function is to transmit whatever rotary motion may
135 be communicated to this crank to the opposite crank at the opposite end of the shaft. That is performed through a torsional strain in the shaft alone. In the other device, Exhibit B, while the spring is the same as in Exhibit A, yet the connecting bar between the shackles performs an entirely different function from the connecting bar in Exhibit A in that *that* it is not necessarily keyed tight to the shackle and transmits whatever motion may be communicated through it by one spring to the other principally by bending as a beam, as its point of application to the shackle is below the center of oscillation, and whatever strains are communicated to this must necessarily be communicated by bending as a beam from one to the other.

Q. Assuming that the combination, as shown in Defendant's Exhibit A, is composed of the half-elliptic springs, the shackle bars—

A (Interrupting.) Excuse me. May I interrupt you a moment? I would not call those shackle bars; they are not. They are cranks. I do not think a mechanical engineer would call them shackle bars.

Q. Then assuming that this connection, as shown in Defendant's Exhibit A, consists of the two half-elleiptic springs, the shafts at each end of the buggy frame attached, as you have described, to the

frame and working in their bearings, and the cranks rigidly attached to each end of these shafts and connected to the springs by a pin—assuming that is the combination shown in the device Defendant's Exhibit A—what element or elements of this combination, if any, are wanting in Defendant's Exhibit B?

136 Objected by counsel for respondent as incompetent and immaterial.

A. The element of a shaft is wanting in Defendant's Exhibit B to communicate motion from one spring to the other. If I may I will explain wherein there is no element of a shaft in this Defendant's Exhibit B. This pin at the top of the C-shaped jack may be made perfectly loose right through here (indicating) just simply to suspend this, and well headed on each side to prevent lateral motion, and all the functions that were intended for this to perform will be performed equally as well with that pin loose as if it were tight. The very construction of this in Exhibit A requires that this crank shall be rigidly connected with the axis of revolution to communicate the motion from one spring to the other. If this crank were loose, it would communicate no motion whatever to the opposite crank. Whatever motion is communicated in Exhibit B is communicated through a twisting of the shackle or this pin. It would be lateral bending of the spring at both ends of the shackle, and whatever motion is communicated from one spring to the other by means of this connecting rod is communicated by reason of the rigidity of the connection of the first-named end of the rod with the shackle and pins and the stiffness of the rod itself. It is immaterial whether the connection at the opposite end is rigid or loose or simply has a bearing against it, as far as communication of motion is concerned. Whereas in Exhibit A it is absolutely essential that the shaft and cranks form a rigid acting element.

Q. What element or elements, as shown in the device Defendant's Exhibit B, if any, is or are wanting in Defendant's Exhibit A?

137 A. There is an element of four loose shackles and two beams, connected, as shown in the model, by means of crank pins.

Q. How does the motion transmitted by the shaft and cranks, shown in Defendant's Exhibit A, correspond with or differ from the motion transmitted by an ordinary shaft in other devices?

A. It is exactly the same, except that it does not make an entire revolution.

Q. So far as it does revolve is it the same?

A. Its motion is the same and its functions are exactly the same.

Q. How does the motion transmitted by the shaft and crank shown in Defendant's Exhibit A differ from the motion transmitted by the beam or crank pin as shown in Defendant's Exhibit B?

A. In Defendant's Exhibit A the motion imparted to one end of the shaft will be exactly imparted to the opposite end in the same degree regardless of the length of the shaft. The final transmission of motion from one end to the other will be the same, barring

the friction of the journals. The motion communicated from one spring to the other in Defendant's Exhibit B is dependent entirely on the stiffness of the connecting rod as a beam from one shackle to the other, and that proportion of the motion of the one spring will be commun-cated to the other only in so far as the relation of the stiffness of the beam bears to the power that is applied to the original spring, and the distance that the second spring would move in proportion to the first would be determined inversely by the amount of the bend of this beam. If the beam was light there
138 would be less motion communicated to the opposite spring. If heavy there would be more of that motion. It differs in that way. The degree of equal strain in the two springs will depend on the degree of stiffness of this connecting bar, while in Defendant's Exhibit A the entire motion of one spring is communicated to the other as the rod is in torsion, and in order to transmit that motion it must have the means of equal reaction in the other spring.

Q. Can you state if the shaft in Defendant's Exhibit A is the same size of the connecting rod in Defendant's Exhibit B what the difference would be in the amount of motion that will be communicated from one spring to the other, assuming the two rods to be the same?

A. I cannot state off-hand what that would be. It is a matter of figuring.

Q. Which would be the greatest amount?

A. The shaft in any case would give its full value in motion from one spring to the other. The beam would only give its proportional amount, as I stated before, to its stiffness. The ratio between the two, if they are the same size, will depend entirely on the ratio of the size of the bar to the length in Defendant's Exhibit B, while in the shaft in Defendant's Exhibit A the length has nothing to do with the communication of the motion from one spring to the other.

Q. Assuming that they are both about three feet long and about a half to five-eight-s of an inch thick, what would be the difference in amount or proportion of the transmission of movement to the springs?

A. I cannot tell without actual figures. If I had the
139 amounts given I could figure it.

Q. In which case would it be the greater?

A. In the shaft it would be, I should safely judge, from six to ten times greater — that in the rod or beam of the same size in Exhibit B. That, I want understood, is not calculation, but it is just my judgment.

Cross-examination by Judge HALE:

Q. Supposing the shaft in Defendant's Exhibit A and the beam, as you say, in Defendant's Exhibit B were each cut off, then would the springs in the two operate substantially alike?

A. Exactly.

Q. Then the difference in operation of the two is not in the shackle of Exhibit B and the crank of Exhibit A?

A. I do not think I could answer that in just yes or no, for the reason that there is another element that comes in there. You specify crank in one case and shackle in the other.

Q. I use the terms that you use.

A. You have cut off the very thing that makes it a crank, and then ask me a question with that same term given. I could not answer it in that way, for the reason that it — no longer a crank—it is a shackle—and they are both the same.

Q. Then by cutting off the beam in the one and the shaft in the other you leave the two exactly the same.

A. Yes, sir; provided you cut off the shaft outside of the bearing so that the two opposite cranks or shackles are not connected; it leaves them both shackles.

140 Q. One becomes a crank and the other remains a shackle, depending upon the mode of connection between the two. Is that it?

A. The mode of connection; yes, sir; or the functions that it performs.

Q. Suppose now in Exhibit B the beam ran from the top part of one shackle through to the top of the other shackle straight and connected solid as you find it in Exhibit A, then would the operation of the two be substantially the same?

A. Exactly the same.

Q. Now, if the shaft in Exhibit A was bent up or down, would it make any difference in the operation of that shaft?

A. It certainly would.

Q. Then, as I understand you, it makes a difference whether the shaft runs through straight, connected solidly at each end, or whether it is connected solidly at each end and bent in the middle?

A. It changes the mechanical construction; it makes a different device of it; one is a crank pin, the other is a shaft.

Q. I am speaking of its operation.

A. It operates through entirely different elements. One operates through the element of tors*o*r*i*al strain; the other operates through the element of bending strain, as a beam, and the bending would be in proportion to the length of the bend.

Q. Supposing the shaft in Defendant's Exhibit A to be fastened precisely as it is to the crank, as you call it, extending out one-third the distance straight from each crank and then curving up or down, would it produce a different result than it now produces, as you see it in the model?

141 A. It certainly would; decidedly.

Q. Will you explain the different effect and result?

A. Yes, sir. In Defendant's Exhibit A, where there is purely a shaft and crank connection motion, the whole of the force applied at the first crank is transmitted directly through the shaft by reason of torsion to the crank at the opposite end, whereas of a shaft similar in all respects, but long enough to allow of its being bent down into the form of a crank at one-third of the distance from its crank ends or supports, so as to leave its supports the same distance apart, as in the first case of the shaft, were employed, the action and motion

communicated from the crank at one end to the crank at the other, in this case, would be different from that of the straight shaft. In that in the first case the entire force applied at one end of the shaft would be communicated entire to the opposite end of the shaft, while in the second case of the bent shaft a part of that motion would be taken up in an end pull on the bearings of said shaft with the crank, due to the deflection of the horizontal part of the bent part or the crank pin in the middle between the bearings. This deflection of this bent crank part would necessarily elongate this part (indicating). That elongation means a longitudinal strain in the same or on the bearings on which the whole turns, and that much is lost in communicating the motion from one end to the other. I would state that that is simply a matter of figuring. With an equal sized shaft I could figure out exactly the difference.

Q. The result obtained, then, is only a difference in degree?

A. Yes, sir.

142 Q. It is of the same nature, but it is diminished in the one case from the other?

A. Yes, sir.

Q. Suppose instead of the beam, as you call it, shown in Defendant's Exhibit B, you use the shaft extending straight from the top of each shackle and fastened solidly at each end, then you would have the same result as you would have if constructed according to model Defendant's Exhibit A?

A. I cannot answer that just in the way that it is asked. There are two conditions that make it impossible to answer it. You said at the top. If you had said at the axis, it may be that the top of that is prolonged here.

Q. I mean just as it is?

A. It may be fastened over the top of this and that would change it again. If you substitute at the axis—I know that is what you mean—then it would be precisely the same.

Q. And the difference in the result in the two, then, arises simply and only from the curving of the beam or shaft?

A. The difference in the result arises only from that.

Q. This difference could be overcome, could it not, by leaving the beam in its present shape, as shown by Defendant's Exhibit B, and increasing its size to arrive at the same result?

A. Yes, sir; there is one modification that I might want to put to that. I say the same result—the same result theoretically, assuming there is no friction. But practically the result would not be the same, for the reason that owing to this twisting on the shackle, due to the beam, you could not communicate all the power ap-

143 plied at the one side to the opposite side. Theoretically the result would be exactly the same, provided the beam were strong enough.

Q. Could not the size be increased to entirely overcome that difference, so that the result would be the same?

A. Exactly.

Q. With the same attachment of the shaft at this point (indicating) in Defendant's Exhibit B as in Defendant's Exhibit A, the

form of the shackle extending to the spring would make no difference?

A. In what way?

Q. In its operation—in the effect and the result.

A. Theoretically it would not.

Q. If the shackle extending from the top suspending the spring was cut in two, you would have the link instead of this being solid?

A. Yes, sir.

Q. And that makes no difference in its operation?

A. It makes no difference in its operation, theoretically. Mechanically one is more rigid than the other, but theoretically they are the same. Whether they are split through here (indicating), that is simply a matter of whether there are two pieces or one.

Q. Then, to change model Defendant's Exhibit B so as to produce precisely the result that you have in Defendant's Exhibit A, you have only to straighten the beam or shaft and attach it at the axis solidly to the shackle?

A. That is all.

Q. In model Defendant's Exhibit B is the beam attached
144 solidly at the axis of the shackle or otherwise?

A. No, sir; it is not.

Q. Do you say that?

A. It is not intended to be. It is simply riveted so that it cannot come out. It is not keyed to it. If I had a pair of pinchers I could turn this rivet. These would perform as well as if they were loose.

Q. As a matter of fact, it does turn as if solidly attached at the axis. The whole turns together, does it not—the shackle and the beam?

A. And the pin.

Q. The shackle, beam, and pin all turn together, do they not?

A. All move together.

Q. Then, continuing to keep that same movement there and straightening the beam is all you have to do, is it not?

A. You could not straighten this beam in Defendant's Exhibit B and do it. By making that a shaft it would be the same.

Q. Well, by putting in a straight shaft, then, and keeping the attachments the same it would do it, would it not?

A. Yes, sir.

Redirect examination.

By Mr. SHERMAN:

Q. Suppose you straighten this beam in Defendant's Exhibit B and attach it as Judge Hale has asked you to, would not that be a substitution of a shaft for a crank pin?

A. It certainly would.

Q. What similarity or dissimilarity is there, mechanically
145 speaking, between a shaft and a crank pin?

A. They are two different devices.

Q. And by substituting a shaft for the device which you call a crank pin or beam in Exhibit B, then you get the device shown in Exhibit A?

A. Yes, sir.

Q. And only by that substitution?

A. That is the only way.

Q. You may examine Defendant's Exhibit A and state what you find as to the rigidity of connection between the shaft and the two cranks attached to each end of the shaft.

A. This (Defendant's Exhibit A) is rigid and undoubtedly is intended to be rigid with the shaft and to act as a crank.

Q. Both of the arms?

A. They are all cranks, as they are tight on the shaft—rigid with the shaft.

ALEXANDER E. BROWN.

JOHN L. FINN, of lawful age, being by me first duly sworn, as hereinafter certified, testified as follows:

(By Mr. SHARMEN:)

Q. State you- name, residence, and occupation.

A. John L. Finn; Elyria, Ohio; I am a practical watchmaker.

Q. State whether you are a practical mechanic.

A. I consider myself so; yes, sir.

Q. And how long have you been such?

A. Since 1858.

Q. Have you a practical knowledge of the construction and operation of machinery?

146 A. Yes, sir.

Q. You may examine the two models shown, Defendant's Exhibit A and Defendant's Exhibit B, and state wherein they differ one from the other in construction and operation.

A. The operations of functions are supposed to be, as near as I can see, the same. The efficiency of the way in which that is produced seems to be quite different—it looks so to me—in the two models. This one (Exhibit A) seems to be, from its peculiar construction, the most efficient and the most likely to perform that operation the best and most perfect. In other words, this (Exhibit A) performs it to a great deal the best advantage mechanically.

Q. Assuming that Exhibit A is a combination composed of two half elliptic springs, a shaft at each end, on the outer ends of which are rigidly attached two arms, on which the springs are hinged, what element or elements of this combination, if any, do you find in Defendant's Exhibit B and what do you not find there? I would further assume that the rods in Defendant's Exhibit A move in bearings at each end of the rod or shaft attached to the buggy frame.

A. In this Exhibit B I do not find the same elements that I do in the other, because the mechanical arrangement is such that they do not seem to exist there. This (Exhibit B) carries the motion from spring *a* to spring *b* by a different means than the motion is

carried from spring *a* to spring *b* in Exhibit A. In Exhibit A the motion is carried from one crank to the opposite crank through the medium of a rigid shaft or a shaft rigidly attached to the cranks.

147 In Exhibit B the motion is carried from one set of springs to the opposite set of springs through the medium of a beam or crank pin, as you may choose to call it. The crank or beam is a part from the center of motion on which the links swing in the one case, and in the other the torsion is communicated through the rigid rod lying exactly in the center of motion of the links. This beam serves the end of a crank pin—that is, you may throw away these two forks, this bifurcation, the middle of shackle bar, and att-ch that by forging it right on there (indicating), and it will perform every office that it does now, unless that pin should be rigidly welded in there and welded in here (indicating), and then there would be whatever is due to tors-onial strain added to it, but there is no element any further than that.

Q. State whether you find any shaft in Exhibit B.

A. Not what would be called, mechanically, a shaft; no, sir.

Q. Which is the most effective in transmitting motion—the crank pin or the shaft?

A. The shaft is; due to its directness and rigidity, and the fact that it is close to the center of motion and not removed out towards the long arm of the lever.

Q. Let me ask you whether the effectiveness of the crank pin would not depend upon the distance from the center of motion.

A. Yes, sir. If it was dropped it would be less effective than it would if it was carried up high. The higher it was carried, the nearest to the center of motion, the more effective; the lower it was dropped the more ineffecient.

Q. When you reach the center of motion what does it become then?

148 A. A shaft. It ceases to be a crank pin because it does not revolve around a center of motion, but revolves around its own center of motion.

Q. And the two are distinct things in mechanics?

A. Yes, sir; do not serve the same end at all.

Q. Can you show by any drawing that you have made the difference in operation between a shaft and a crank?

Objected to by counsel for respondent as incompetent and immaterial.

A. I think I can show the difference that apparently exists by a drawing.

Counsel for complainants offer in evidence a pencil drawing, which is marked "Complainants' Exhibit M."

Q. Take the pencil drawing marked "Complainants' Exhibit M" and state what that is.

A. Figure 1 is simply the principle involved in all shafts actuated by a pulley or a lever driven by some external force. Fig. 2 is the same thing, except that embraced between the point of power and

the distant point that receives power is interposed to communicate that motion a crank pin. That is all. Now, this one that interposes the crank pin I claim involves the same principle that Exhibit B does. This one that represents the direct shaft, Fig. 1, involves the same principle that Exhibit A does. I claim that these are substantially the same in principle, so far as their propelling power goes, but not so far as their operation goes.

(By Judge HALE:)

Q. But not in effect?

A. Not in effect; no, sir. The principle of the two, as I understand it, is just alike.

149 (By Mr. SHERMAN:)

Q. In transmitting power by Fig. 1 in this drawing what loss of motion is there?

A. No loss of motion.

Q. What would be the effect in transmitting power according to the device shown *shown* in Fig. 2?

A. The effect would be the same as long as the power was not greater than the quality of the material would stand, and then it would twist or wring off or break by torsion.

Q. Where?

A. In that rod.

Q. In what rod?

A. In that crank pin.

(By Judge HALE:)

Q. As long as it could stand it, it would be the same as the other?

A. Oh, yes; if you could make that strong enough you have about the same result; no question about that.

(By Mr. SHERMAN:)

Q. What would be the tendency of the crank pin to bend or break (assuming it to be of the same size as the shaft shown in Fig. 1) beyond the tendency of the shaft, as shown in Fig. 1, to bend or break?

Objected to by counsel for respondent as incompetent and immaterial.

A. This rod, which we call the crank pin in Fig. 2, serves the purpose of a lever between the two springs represented in Fig. 2 or in Exhibit B. This (indicating) is the long end of the lever, if this (indicating) is the side propelled; and if this (indicating) is the side propelled, this (indicating) is the long arm of the lever.

150 The tendency then is, if you work on a long lever like that, unless the lever is very strong indeed, to deflect it out of a straight line, finally bend it, and finally break it.

Q. Suppose the lever was just the same size as the shaft, which would break the quickest?

A. The lever would break.

Q. Is there any perceptible tendency to break the shaft, assuming the power used in both devices to be the same?

A. No; not exactly the same; but the tendency to break is existing all the same in both. If they were brass, with the same amount of power, they would both break. If they were steel, they would stand a little more than if they were brass.

Q. Suppose the shaft to be of a certain size—say one-half inch—and suppose the lever or crank pin to be of the same size, what would be the proportional tendency between the two to bend or break?

A. If this crank pin was put in there of the same diameter as this driving shaft, and used as it is represented here in the drawing, it would not communicate, probably, more than one-sixth or one-eighth of the power that the shaft of the same diameter would communicate—not more than that, if it would do that. Probably it would not do that.

Q. And what would be the proportional tendency between the two as to bending or breaking?

A. The same then. The crank pin would have to be six to eight times as large as the shaft to carry the same amount of power over there without a loss of power by its bending or twisting or deflection. It would carry it, but it would have to be very
151 heavy.

Q. Suppose in Exhibit B you raise the rod or crank pin up until it is placed in the center of motion at the top of the C-shaped jacks; state what change in the character of the rod itself takes place then—it becomes what?

A. It becomes a shaft and ceases to be a crank pin. A crank pin must rotate around a center of motion to which it is eccentric, as you might say—to one side.

Q. Suppose you move the crank or pin rod, shown in Exhibit B, from the center of the shackle, as it now appears, to the bottom of the shackle and attach it there, what would be the tendency—an increase or decrease—towards bending or breaking?

A. It would increase as you carried it out on the long arm of the lever, and decrease as you carried it out towards the center of motion or short arm, because it would have that side strain which is a torsion.

Cross-examination.

By Judge HALE:

Q. In either case—in model Exhibit A or Exhibit B—in practical use there is a tendency to break or give way—there would be a strain in either case upon the bar or shaft?

A. Oh, yes.

Q. That strain is more as shown in Exhibit B because of the curvature of the beam or shaft?

A. Yes, sir.

Q. Each of them have a tendency to break, but it is only in degree?

A. That is all.

Q. The result obtained by each is of the same nature and
152 kind—the principle is the same?

A. The result would be the same, only differing in degree.

Q. If you increase the size of the beam, as shown in Exhibit B, you may obtain the same result in kind and in degree as in Exhibit A?

A. I should say you could; yes, sir.

Q. If the shaft, as shown in Exhibit A, is bent up a little—from, say, one to three inches or one to two inches—does it then cease to be a shaft and become a crank?

A. That part that is deflected out of the direct line between the two bearings on which it turns becomes a crank. That part that is midway between the curves or is at the center of the arc is then the crank pin or means by which the motion is communicated from one crank to the other, as shown in this drawing (Complainants' Exhibit M).

Q. In the model Exhibit B the pin, the beam, and the shackle are firmly attached, are they not, at the axis of motion, so that they move together, apparently?

A. The beam and the pin probably turn in unison with each other, or they might be made so without influencing the action of the construction at all.

Q. They would have to be to effect the result?

A. Oh, no, not to effect the result in Exhibit B. In a very limited sense they might, because there would be a tendency in that to use the torsion of that diameter of pin in turning.

Q. This beam and rivet pin being rigidly attached to the axis, then you get from that combination with the spring the same result
153 in kind that you get in Exhibit A?

A. No, sir; not as long as you did not have any material running between these two points (indicating), because you rely finally upon this piece (indicating) to carry the motion over there again; therefore it would resolve itself into a crank pin again.

Q. I do not ask you as to the principle, but it would produce the same result?

A. The same result; yes, sir. It would not make any difference about that.

Redirect examination:

Q. In using this rod or crank pin, as shown in Exhibit B, in order to get the same result that you get in using the shaft, as shown in Exhibit A, you would have to increase the weight and diameter of this rod, I understand you to say?

A. Oh, yes.

Q. To a very considerable extent, would you not?

A. Oh, yes; it would be to a large extent. It would be from three to six hundred per cent.

Q. Would not that be a practical objection to the use on a carriage as an equalizer?

Objected to by counsel for respondent as immaterial and incompetent.

A. As an equalizer of the spring motion?
A. Of the spring motion.
A. Well, it would seem to me it would make a bulky mechanism.
Q. And heavy?
A. And heavy. It would be a bulky mechanism, and consequently heavy. I do not know, as I stated before. This beam
154 or crank pin in Exhibit B would probably be three times as large in diameter, at least, as this shaft in Exhibit A would to bring about the same result. It would be increased from that to six times. I could not tell without figuring it, but it would not be less than three and might run up to six.
Q. What size is this rod?
A. It is seven-sixteenths of an inch in that model.
Q. Suppose that model would carry 25 pounds, what sized rod would it require to carry, say, 500 pounds?

Objected to as immaterial and incompetent.

A. I could not tell unless I figured it, and there might some other things come in there. I could not tell.

JOHN L. FINN.

GEORGE H. ELY, of lawful age, being by me duly sworn, as hereinafter certified, testified as follows:

(By Mr. SHERMAN:)

Q. State your name, residence, and occupation.
A. George H. Ely; residence, Elyria, Ohio; occupation, manufacturer of carriage hardware.
Q. You are one of the complainants in this case?
A. Yes, sir.
Q. How long have you been engaged in the manufacture of carriage goods?
A. A little over eighteen years.
Q. What are you now manufacturing in general?
A. Carriage hardware.
Q. How long have you been manufacturing connecting
155 rods for carriages and buggies?
A. Thirteen or fourteen years.
Q. To what extent have you been making these rods from the time you begun?
A. A few the first year, and from that increased up—this would be entirely an estimate—to ten or fifteen thousand sets a year.
Q. You are now manufacturing ten or fifteen thousand sets a year?
A. Yes, sir.
Q. What sort of connecting rods are you making now and have been making?
A. We are manufacturing the kind as shown in Defendant's Exhibit A and our own Exhibit A.

Q. Those two models that you name show the devices that you have been making?

A. Yes, sir.

Q. They are the same devices shown in both models, are they not?

A. Yes, sir.

Q. Who, besides yourself, that you know of, have been making connecting rods containing the devices shown in the two models you have spoken of?

A. We know of no one except the defendant.

Q. You are making these connecting rods under a patent.

Objected to by counsel for respondent as incompetent and immaterial.

A. Yes, sir.

Answer objected to on the same ground.

Q. Under what patent?

Objected to on the same ground.

156 A. The patent issued to us upon which we are bringing suit.

(The reissue of March, 1876, is the patent referred to.)

Objected to on the same ground.

Q. You are the owners of other patents for this or similar devices?

Objected to on the same ground.

A. Yes, sir.

Q. And known as what?

Objected to on the same ground.

A. Known as the Saladee patent and the Augur patent.

Objected to on the same ground.

Q. Those are the patents that have been put in evidence by you?

A. Yes, sir.

Q. What knowledge, if any, have you of any person or persons having up to this time infringed any of your devices or rights secured by those letters patent except the defendant?

Objected to on the same ground.

A. We never have known of any except one case in Chicago, and after notifying that party that he was infringing we have not known of its being continued.

Objected to on the same ground.

Q. Who was that party?

A. Pennoyer.

Q. Has the defendant in this suit any license from you to manufacture these devices?

Objected to on the same ground.

A. No, sir.

Q. About how long have you known the defendant?

157 A. About fifteen years.

Q. What connection has the defendant had with you during those fifteen years?

Objected to on the same ground.

A. He traveled for us from about 1870 to 1878, more or less; not continuously.

Objected to on the same ground.

Q. During what portion of the time that you have been manufacturing these devices or this device was the defendant connected with you?

Objected to on the same ground.

A. A little over half the time.

Objected to on the same ground.

Q. Between what periods, about, during the time you have been making this device has he been connected with you?

Objected to on the same ground.

A. From 1871 to 1878.

Objected to on the same ground.

Q. During this time that he was connected with you was he engaged in selling these goods for you as well as other goods?

Objected to on the same ground.

A. Yes, sir.

Q. When did he sever his connection with you?

Objected to on the same ground.

A. I think in 1878. I am not positive.

Q. When did he begin, if you know, to manufacture this device covered by your patent?

Objected to on the same ground.

158 A. I cannot fix the date from my own knowledge of it, but, as I remember, it was about three years ago, though I have no means here of determining the date.

Q. What experience have you had as a practical mechanic?

A. I learned the machinists' trade before going to college. I have worked around machinery for the last eighteen years, more or less; not so much for the last eight years, but for the first ten years that I was in business.

Q. What kind of machinery in general have you worked around?

A. Both iron-working and wood-working machinery.

Q. You are familiar with carriage manufacture, are you?

A. To a certain extent; yes, sir.

Q. State whether you have examined and are familiar with the patents of John B. Augur, Cyrus W. Saladee, and Topliff & Ely, all exhibits in this case.

A. Yes, sir.

Q. State whether or not the devices shown and described in those patents are susceptible of joint use, if desired.

Objected to on the same ground.

A. Yes, sir.

Objected to on the same ground.

Q. You may examine the models, Defendant's Exhibits A and B, and state what differences, if any, exist, in a mechanical point of view, in their construction or operation.

Objected to on the same ground.

A. Defendant's Exhibit A shows the action of the connecting rod as manufactured by us, and the object to be attained is the equalization of the springs.

Objected to on the same ground.

Q. How is that accomplished?

159 Objected to on the same ground.

A. It is accomplished by a rotation of the shaft, which, through the rigid arms or cranks, connects the two springs at each end. The connection between the opposite shackles in Defendant's Exhibit B is a brace to prevent their swaying sideways on account of the height at which they are hung.

Q. Have you examined the patent of Stringfellow & Surles, from which Exhibit B was made? And, if so, state where, in the specifications or drawings, there is any device shown or claimed for the equalization of the springs.

Objected to on the same ground.

A. I can find that there is nothing claimed. It may be possible to get a very imperfect equalization, but no mention of it is made in the patent anywhere or in the specifications or claim.

Objected to on the same ground.

Q. If any equalization of the springs is shown in the patent or in the model Exhibit B, how is that equalizing motion conveyed from one spring to the other?

A. It is conveyed through what is called the tie-braces, which are put in as a brace between these two C-shaped jacks, which may equalize a little as a crank and not as a shaft.

Q. Mechanically speaking, what is that rod connecting the springs in Exhibit B termed?

A. Crank pin.

Q. What is the rod as shown in Exhibit A termed in mechanics?

A. That would be a shaft.

Q. What is the difference between a crank pin or lever and a

shaft, mechanically speaking, in their operation or construc-
160 tion?

A. A shaft transmits the power direct from one end to the other. A crank pin transmits it through the arm of the crank to the shaft.

Q. Supposing there was no shaft?

A. I suppose a crank cannot be used for any purpose without being attached to a shaft.

Q. Look at Exhibit B and show where the shaft is that is acted upon by the crank pin.

A. There is none there.

Q. What element contained in Defendant's Exhibit A do you find wanting, if any, in Defendant's Exhibit B?

A. The shaft.

Q. What element in Defendant's Exhibit B do you find wanting in Defendant's Exhibit A?

A. The crank pin.

Q. State whether, mechanically speaking, a crank pin is the equivalent of a shaft.

Objected to on the same ground.

A. It is not.

Objected to on the same ground.

Q. It is an entirely different mechanical device, is it not?

Objected to on the same ground.

A. Yes, sir.

Q. State whether you have ever seen or known a device similar to that shown in Defendant's Exhibit B to have been practically used.

Objected to on the same ground.

161 A. I never have seen one—that is, applied to a vehicle—in use.

Objected to on the same ground.

Q. Do you know of any reason why it has not been used?

Objected to on the same ground.

A. One great objection to its use would be the height at which the body is hung. The great aim among carriage-makers lately has been to hang their bodies low. It would be impossible to use this without hanging the body so high that it would be probably a fatal objection to the device, and may account for its never having been introduced.

Objected to on the same ground.

Q. State whether hanging the device shown in Defendant's Exhibit B on the axle bed or the rocker plate, or one, two, or three inches higher, would make any difference in its operation.

Objected to on the same ground.

A. It would be impossible to have it work at all if it was hung immediately to the axle or rocker as the rod is shown hung in Defendant's Exhibit A, for the reason that this crank pin would strike the reaches of the carriage, which would prevent any motion back and forth, so that it would serve no purpose whatever as an equalizer. That device shown in Exhibit B must be hung up at least as high as the distance from the top of the jacks to the crank pin to be used; otherwise there would be no movement whatever of this crank pin, its motion being interfered with by the reaches of the buggy.

Objected to on the same ground.

Q. Can that device be used unless it is hung in some similar way as that shown in the model?

162 Objected to on the same ground.

A. I think it would be impossible to hang it without hanging it at an objectionable height.

Objected to on the same ground.

Q. Why do you say that the height is an objection?

Objected to on the same ground.

A. Because it is an objection to have any carriage higher than necessary—objection in getting in and out; there is more danger of upsetting. The equilibrium is not as stable, and the appearance would be decidedly against it.

Q. How would the sales be affected?

Objected to on the same ground.

A. I should not think that any one would purchase a buggy constructed in that way.

Cross-examination by Judge HALE:

Q. You say you learned the trade before you went to college?

A. Yes, sir.

Q. At what age did you go to college?

A. Sixteen.

Q. And you were a finished machinist at that time?

A. I was enough of machinist to be earning two dollars a day in the machine shop.

Q. Where did you work?

A. I worked in the West & Wilson Sewing Machine Factory.

Q. Are you now manufacturing connecting rods under the
163 patent of Topliff & Ely or the Augur patent?

A. Both.

Q. Any difference in the two?

A. Yes; there is a difference between the two.

Q. How long since you owned the Augur patent?

A. We have owned it a year, more or less. I do not remember exactly.

Q. Prior to your obtaining the Augur patent you were manufact-

uring connecting rods substantially as you are now manufacturing them.

A. Yes, sir.

Q. In the same way and according to the same pattern?

A. Yes, sir.

Q. And you had been for several years?

A. Yes, sir.

Q. The Augur patent, I understand, is prior in date to any of the patents of Topliff & Ely?

Objected to by counsel for complainants on the ground that the records are the best evidence.

A. Yes, sir.

Q. Referring to Defendant's Exhibit B, what is the fact as to the construction there shown having the effect to equalize the weight upon the springs or not? Does it have any such tendency?

A. If the tie-brace is made sufficiently stiff, to a certain degree it would equalize the action of the springs.

Q. Could you obtain the same result from a construction of that kind shown in Exhibit B, by making it sufficiently strong,
164 as you could obtain from the construction shown in model Exhibit A?

A. Not without making it so large that it would be objectionable.

(Question repeated.)

A. I do not know that I will answer it any differently from what I did before.

Q. It could not be done, then, could it?

A. Not without making it so large that it would be objectionable.

Q. It is not possible to make it arrive at the same result by the one as by the other, is it?

A. It could be done by making it objectionably large.

Q. Then it could be done?

A. I have answered the question, sir.

Q. Well, I put the question.

A. By making it objectionably large, it could be done.

Q. You will not give an answer, except you couple it with "objectionably large." You want to stick an argument in with your answer.

A. I wish my answer to convey the truth. It would not convey it unless I did stick that in.

Q. When you are asked whether it is possible to bring about the same result, an answer that it would be possible would not answer the question, would it?

A. That is satisfactory to me.

Q. I understand; but that you could not do it without making it objectionably large is simply an argument after you stated the facts, is it not?

Objected to by counsel for complainants.

165 A. Any one could decide that for himself as well as I could. I should not consider it an argument. Whether others would or not I do not know.

Q. You do not want it to appear in your deposition without any modification that you could bring about the same result by the device shown by Exhibit B as you could by the device shown by Exhibit A?

Objected to by counsel for complainants.

A. I do not want it to appear in any other way except just as I have stated it.

Q. And you think you have stated it the most favorable to yourself, do you not?

A. I think I have stated it as near the truth, according to my belief, as I can state it.

Q. Then the question could not be answered as to whether the same result could be brought about without adding to it "unless it is objectionably large"?

A. I am not competent to state how questions could be answered. I can only state what answers I can give that will satisfy my belief. I cannot say what other people can answer.

Q. You are not answering, then, as to the fact, but as to belief?

Objected to by counsel for complainants.

A. That is all I can answer—as to my belief about facts or anything else.

Q. Then there is nothing but belief in what you have given? You know no facts connected with this? It is all belief with you?

166 Objected to by counsel for complainants.

A. I suppose a person can have a belief from facts.

Q. You cannot know a fact. Every fact is simply what you believe, then?

Objected to by counsel for complainants.

A. Of course, you can know a fact.

Q. That is simply a fact—whether it is true or untrue that the same result can be brought about.

A. I can only answer that as I have answered heretofore; repeat what I have said heretofore.

Q. I am asked to inquire why you could not hang that directly under the axle or at the side, out here at the end, and get it as low as you liked?

A. Because it would strike the reach—the cross-tie would strike the reach. In a buggy the axle is about the height of the reach. You cannot hang anything from the axle without the reach interfering with it unless you hang it clear under the reach.

GEO. H. ELY.

HENRY F. WILLSON, of lawful age, being by me duly sworn, as hereinafter certified, testified as follows:

(By Mr. SHERMAN:)

Q. State your name, residence, and occupation.

A. My name is Henry F. Willson; residence, Elyria; at the present time I am engaged in mechanical business.

Q. How long have you been engaged in mechanical business?

A. It is five or six years since I have been practically engaged in the mechanical business.

Q. How long have you been familiar with machinery and
167 mechanical appliances and devices?

A. Perhaps I could answer that better by saying what business I have been engaged in. In 1846 I was engaged with Howe & Fairbanks as consulting engineer and draughtsman. I was with them two years. I went from there to the Scientific American office in 1848. I was there engaged in the same business. In 1852 I left there and went into the United States Patent Office.

Q. How long and in what capacity were you there?

A. As draughtsman. I was not a great while in the Patent Office; it was from six to eight months—somewheres in that neighborhood. After Pierce came into the administration, there was a change. Then I engaged in the soliciting of patents and mechanical drawing from that time up to 1856, except a short interval of six or eight months, and since that time I have been engaged in various ways in and about machinery, soliciting patents, and inventing, and so on; and for the last six years I have been actively engaged in repairing and inventing and one thing and another—making models, patterns, and so on, in a small way.

Q. Look at Defendant's Exhibit B and Defendant's Exhibit A and state how, if at all, those devices differ in mechanical construction or operation.

A. I find in Exhibit A that the springs are hung upon crank arms that are rigidly attached to the rocking shaft at each end.

Q. How does the shaft move?

A. The shaft oscillates in bearings, fixed bearings, attached to the frame of the buggy. I find that if a weight was applied
168 to one of the springs that the deflection of the spring applies a torsion to the rocking shaft which transmits the same motion to the opposite spring—a corresponding motion at both ends.

Q. How is it in Defendant's Exhibit B?

A. I find there the device is evidently designed for a similar purpose, and yet I find a different construction.

Q. State what the difference in the construction is, or its operation.

A. I find there that instead of a shaft, as in Exhibit A, that the springs are connected together by means of a bar that extends laterally across the buggy or vehicle and transmits the motion from one spring to the other in that way, which is equivalent to a crank movement.

Q. The rods being the same, what would be the difference in the motion communicated to the springs in each case, if any? Will the same amount of motion be communicated in both cases?

Objected to by counsel for respondent as immaterial and incompetent.

A. I should think not.

Q. In mechanics, is a crank pin the same as a shaft?

Objected to on the same ground.

A. No, sir.

Q. Assuming that the device shown in Exhibit A is a combination of two side springs hinged at each end onto two crank bars which are rigidly attached to a shaft moving in bearings attached to the buggy gearing, what element, if any, of this combination do you find wanting in the device shown in Defendant's Exhibit B?

169 A. I find the absence of a shaft in Exhibit B which is in Exhibit A.

Q. Examine Exhibit B and state what element in that model, if any, is wanting in Exhibit A.

A. I find that what is termed the crank pin is wanting in Exhibit A.

Q. State whether in mechanics a crank pin is a known equivalent to a shaft.

Objected to on the same ground.

A. They are not equivalent devices. A shaft revolves upon its own center of motion, own exle; a crank is a point revolving around that axle.

Cross-examination.

By Judge HALE:

Q. All shafts to a certain extent are cranks, are they not?

A. I should think not.

Q. They revolve around their own center, do they not?

A. Yes; and a shaft revolves around its own center.

Q. The outer edge would have the crank movement, would it not?

A. If you take a point on the periphery of a shaft and apply power to that point, it would act in the capacity of a crank. That point would revolve around the thick center just the same as this crank would. The point to which you apply the power, be it on a shaft or be it on a fixed crank, or what we generally understand a crank, the power applied to any point on that shaft would transmit power, as a matter of course, to the shaft and rotate it, and in that sense it might be considered as a crank. But that point to which the power was communicated would pass around to the center independent from the shaft itself. It would, in fact, act as a point the same as a crank would act.

170

Q. All shafts revolve around a common center, do they not?

A. Certainly. A pulley placed on a shaft would act in the capacity of a crank.

Q. A crank is a shaft enlarged, is it not?

A. Oh, not—not necessarily. It is not so, in fact.

Q. Suppose the shaft starts at one end two inches in diameter and increases at the other to six inches in diameter, what would you call it in that case—a shaft or a crank?

A. Certainly a shaft.

Q. I understood you to say you get the same result in kind from the devices shown by the two models, A and B.

A. I should answer that question by saying yes, you get the same result in kind.

Q. The device, as shown in Exhibit B, to a certain degree equalizes the weight upon the different springs; will it do it?

A. Yes; to a certain degree, I should think it would.

Q. And you may increase until the two will be equal, may you not, by a mechanical construction?

A. I should think you might.

Q. And how could that be done?

A. By adding volume to this bar or crank pin or connecting rod or whatever you call it.

Q. Until you could bring about the same result by the two?

A. Yes, sir; I think the springs might be equalized in that way.

171 Q. And then you can bring about the same result by the use of the crank pin and bar, if you please, and the shaft as shown in Exhibit A?

A. I should think it would be possible to do it.

Redirect examination:

Q. In mechanics do the crank pin and the shaft perform the same or different and distinct functions?

Objected to as immaterial and incompetent.

A. They perform separate and distinct functions.

HENRY F. WILLSON.

JOHN A. TOPLIFF, of lawful age, being by me duly sworn, as hereinafter certified, testified as follows:

Complainants here offer in evidence a certified duplicate of the Patent Office model of the Stringfellow & Surles patent, dated January 15, 1861, filed in the Patent Office with the original specifications, which model is marked "Complainants' Exhibit N."

Counsel for respondent reserved the right to enter such objection to the above offer as he may see fit to make.

(By Mr. SHERMAN:)

Q. State your name, residence, and occupation.

A. My name is John A. Topliff; residence, Elyria, Lorain county, Ohio. My occupation is manufacturing connecting bars and bow tops at the present time.

Q. You are one of the complainants in this suit?

A. I am; yes, sir.

Q. How long have you been engaged in making connecting rods?

A. Ever since the patent was issued. I forget what the

172 date of the patent is.

Q. Ever since what patent was issued?

A. Our patent for the connecting rods.

Q. What sort of a connecting rod are you making?

A. This (Defendant's Exhibit G) is virtually the same as the ones we are making.

Q. State which model now in testimony, if any, shows you- device.

A. These models, Complainants' Exhibit A and Defendant's Exhibit A, show it.

Q. To what extent have you been manufacturing these connecting rods?

A. I should say from five to eight thousand sets a year. Mr. Ely can tell better than I, but I should say from five to eight thousand sets.

Q. Look at Defendant's Exhibit B and state whether you have ever seen a device of that kind in practical use.

A. I never have; no, sir.

Q. Do you see any reason why that device could not be put to a practical use in the equalizing of springs on carriages or buggies?

Objected to as incompetent and immaterial.

A. The reason that it could not be—the principal reason—is because the rods and braces for an equalizer would have to be too heavy for practical use—that is, they would load the buggy down. They not only would load the buggy down but the cost of the material would so far exceed this that it would spoil the practical use of them.

173 Objected to on the same ground.

Complainants offer in evidence model marked "Complainants' Exhibit O."

Objected to as immaterial and incompetent.

Q. State what this model just offered is.

A. It is a full-sized model—that is, a working-sized model of Stringfellow & Surles' patent, issued in 1861. In every respect the size is increased twelve times from the drawing—I think just twelve times—making it a full-sized working model, these springs being a regular carriage spring of full size. I speak of this only in connection with the iron-work. The wood-work is just put together for the purpose of holding the iron-work. We do not claim that this wood-work is the regular size of a carriage, but it is put together just to hold this with as little wood-work as possible to show the working of the Stringfellow & Sureles patent.

Q. Under whose supervision was this model made?

A. It was made under mine.

Q. State how this model compares with the drawing and specifications of the Stringfellow & Sureles patent now in evidence.

Objected to on the same ground.

A. It is the same proportion in every way, according to their specifications and drawings—taken from them.

Q. State what this model shows as to its power to equalize the motion of the springs.

Objected to on the same ground.

A. It shows that this brace will not do it. This brace—I
174 will say the pair of them weigh nine pounds, while our connecting rods, for the same purpose, weigh but about 4½. This weighs double what our connecting rods do, and then it will not do it.

Objected to on the same ground.

Q. Why?

Objected to on the same ground.

A. On account of the spring of this rod. This rod springs from a point at the top of the jack on one side to the point where the spring is attached to the shackle on the other side.

Q. Look at the device as shown in Defendant's Exhibit A, and assuming that that device is a combination consisting of two half-elliptic side springs hinged at each end to two crank bars or arms, which crank bars or arms are rigidly attached to a shaft turning on its bearings, which bearings are fastened to the frame of the buggy at each end of the rod, and state what element, if any, in that combination you do not find in the device shown in Complainants' Exhibit O, just introduced.

A. This Defendant's Exhibit A has a straight rod running through its bearings with arms attached solidly to the shaft, and the shaft is in bearings that are attached to the wood-work of the buggy frame. I do not find the shaft running through and turning on bearings in Exhibit O. I do not find in Exhibit O two arms welded to the shaft or made solid with the shaft. I do find in Exhibit O, which is not ours, a loose jack or a piece pivoted to the iron on which the spring swings, which is not in Exhibit A.

Q. What element do you find in Complainants' Exhibit O
175 that you do not find in the device as shown in Defendant's Exhibit A?

A. I find in Complainants' Exhibit O a brace bracing the opposite spring running from the jack on the one side to the opposite spring on the other for the purpose of bracing them from a lateral motion. That I do not find in Exhibit A of defendant. I can say, furthermore, that I find in Exhibit O four bolts for the purpose of holding the spring in its place—four bolts at each end of the buggy—while in Defendant's Exhibit A I find but two bolts necessary at each end.

Q. Suppose you increase the size of the cross-tie, as shown in Complainants' Exhibit O, sufficiently, can you then equalize the action of the springs?

A. Yes, sir.

Q. How much would you have to increase that to make this a device that would equalize the springs on each side?

A. As near as I can tell it would take a croos-brace that would weigh about thirty pounds. It would be about two inches in diameter and weigh about thirty pounds.

Q. One at each end?

A. One at each end. The two would weigh about sixty pounds—from sixty to seventy-five pounds.

Q. Would that be, when so increased, of the proportion shown in the drawings of the patent?

A. No, sir.

Q. Would it be larger or smaller?

A. It would be larger. The cross-brace here on Exhibit O is as near as may be to the proportion shown in the drawing.

Q. You are a practical mechanic, are you not?

A. It will be forty years next April since I went to the carriage-making business.

176 Q. You are familiar with machinery?

A. Yes, sir.

Q. And its operation?

A. Yes, sir.

Q. And construction?

A. Yes, sir.

Q. What, as a mechanic, would you call that cross tie or brace when used to equalize the action of the springs?

Objected to on same ground.

A. It would be something of a double crank pin, one end attached to the pivot and the other end attached to the power. It would be more in that form—double crank pin.

Q. As a mechanic, what would you call that rod for equalizing the springs, as shown in Defendant's Exhibit A?

Objected to on the same ground.

A. I would call it a shaft.

Q. State, mechanically speaking, whether what is known in mechanics as a shaft and as a crank pin or crank lever perform the same functions.

Objected to on the same ground.

A. They do not.

Q. What practical objection would there be to the use of this device, as shown in Complainants' Exhibit O, if you increased the size and weight of this cross-brace sufficiently to equalize the springs?

Objected to on the same ground.

A. There would be two objections. In the first place, it would load the buggy down whatever is the difference between sixty
177 or seventy pounds and four and half or five pounds. In the next place, it would be impossible to make them to sell them at the price that we sell ours at, on account of the cost of the ma-

terial. The material would cost more than four or five times what ours does, and the cost of making would increase in proportion, too; so that the cost of such rods, even with all the facilities for making them, would be an objection.

Objected to on the same ground.

Q. As a carriage manufacturer and dealer, what would you say as to the marketability of such a device if made and put on carriages?

Objected to on the same ground.

A. I would say that it would spoil the sale of the carriage entirely.

Q. Why?

Objected to on the same ground.

A. On account of the heft and on account of the inability to perform the purposes for which it was put on if it was put on for a connecting rod or an equalizer.

Q. Suppose the weight and size of the brace was increased so that it would practically equalize the spring, if that could be done, what would you say then as to its marketability?

Objected to on the same ground.

A. Then it would be so heavy that it would not be saleable.

Objected to on the same ground.

Q. Do you see any reason why this device as shown in Complainants' Exhibit O should not have been put upon the market and used regardless of any equalizing of the springs?

Objected to on the same ground.

178 A. The objection then would be on account of the extraordinary height of hanging the body and the awkwardness of the looks of the carriage after it was made. For the purpose of bracing down here it seems very foolish to get this work away up here when it is so simple to hang it down here just where you want it, doing away with all of this brace, this brace being of no earthly use. As soon as you get this down here you do not need any brace.

Objected to on the same ground.

Q. What objection would there be to keeping it at that height?

Objected to on the same ground.

A. At the present time, a buggy being high, it is entirely, you might say, out of style. They are not in style. All buggies are required at the present time to be as low as possible.

Q. How about their salability?

Objected to on the same ground.

A. They are not saleable when they are high. They have to be hung as low as possible to make them saleable.

Q. What would you say about the practicability of hanging this device, as shown in Complainants' Exhibit O, instead of to the C-shaped jacks directly to the axle and bolster of the buggy?

Objected to on the same ground.

A. The objection there would be this: That in making the brace ordinarily in Exhibit O when it was depressed it would strike the middle reach, so that it would not be practicable.

Cross-examination.

By Judge HALE:

179 Q. The fashion as to hanging carriages high or low has changed within the last twenty years, has it not? Some twenty years ago, when this patent was issued, the style was to hang the carriages high, was it not?

A. I presume so. I do not remember just exactly.

Q. That is more a matter of fashion and taste, is it not?

A. Yes, sir.

Q. The result of equalizing the two springs can be brought about by either device, can it not?

A. It can be brought about if the brace is made heavy enough.

Q. But it is possible to bring it about?

A. With a sufficient heft of brace.

Q. Then the heft of the rod is acquired by the curvature of the rod, is it not?

A. That makes the difference.

Q. Then by straightening the rod straight in this model that you produced to-day you overcome this difficulty, do you not?

A. We do; yes, sir.

Q. And it does not make any difference whether it is attached to the C-shaped neck or to the bolster of the carriage?

A. It makes no difference. I want to explain a little.

Q. That difference that you make is plain principle of mechanics to be got at, is it not?

A. What difference?

Q. The effect of the curvature of the rod or torsion of the rod.

A. Oh, yes; that is easy to get at, I think.

180 Q. Then, having a device with the rod as shown in Defendant's Exhibit B, with the rod of a sufficient size, you may equalize the weight upon the springs?

A. Yes, sir.

Q. And what you have got to do in this model to transform it into the other is simply to straighten the rod out, and then you have the same result accomplished, have you not?

A. It would be impossible to straighten that rod out.

Q. Well, make a straight rod.

A. Make a straight rod, make one like this (Exhibit A), and you accomplish the same thing.

Q. You say in its practical working Exhibit B would equalize the weight upon the springs?

A. I do not know whether it will or not. I rather doubt whether it will. It don't seem to (pressing down on spring in Exhibit B). These rods are not heavy enough to do it.

Q. It can be done?

A. I say with sufficient heft you can do it.

Q. In Exhibit B you could make it solid, so that the shaft would turn with the shackle, could you not?

A. In this Exhibit G there is one represented solid that would turn in there if the place was made.

Q. By fixing it to turn solid at the axis and straight you would accomplish the same result as in Exhibit A?

A. Yes; it would be the same result. It would be the same connecting rod, in fact.

Q. Have you ever used this connecting rod shown by Exhibit A, curving it?

A. I think I have in one or two cases.

181 Q. And only in one or two cases?

A. That is all.

Q. And when?

A. I used it on a buggy. The reach stood up so high that for some reason or other I had to make a curve in there to put it on.

Q. How much of a curve?

A. I think I made it an inch and a half.

Q. A gradual curve from one end to the other?

A. Yes, sir; I think it was.

Q. And where was the buggy used?

A. My impression is it was used in Elyria; I do not remember. It is a great while ago.

Q. Was the size of the rod increased; do you remember about that?

A. I think that at that time we made the rods five-eighths and three-quarters. I do not remember whether it was increased or not.

Q. The simple question was whether when you curved it in this way you increased its size at all.

A. I do not think I did.

Q. You think you used the same size?

A. I think I did; yes, sir.

Redirect examination:

Q. When you put that curved rod in did it work satisfactorily?

A. No, sir.

Q. It did not equalize the springs?

A. It did not equalize the springs as satisfactorily as it

182 ought to, and I think I took it off and raised up the ends afterwards and straightened the rod out.

Q. Suppose, as Judge Hale suggested, you put a straight rod through the top of the jack and solidly attach the link or shackle

bar to it, in Exhibit B, you change the whole construction, do you not?

A. Yes, sir.

Q. And substitute a shaft for a crank?

A. Yes, sir.

Q. In that case you do away with the brace that is spoken of in the Stringfellow & Surles patent?

A. Yes, sir; in that case you do not use Stringfellow & Surles' patent, but Topliff & Ely's and Augur's.

JOHN A. TOPLIFF.

(Here follows diagram marked p. 183.)

184 THE STATE OF OHIO, } ss:
Cuyahoga County, }

I, A. C. Dustin, a notary public in and for said State and county, duly commissioned and qualified, do hereby certify that the above-named Alexander E. Brown, John L. Finn, George H. Ely, Henry F. Willson, and John A. Topliff were by me first severally sworn to testify the truth, the whole truth, and nothing but the truth, and their said depositions as above written were by agreement of counsel of complainant and respondent respectively taken in short-hand by A. Hippard, he being a proper person and not interested in the action, in my presence and in the presence of the witnesses respectively, and were reduced to writing by the said Hippard, and by agreement of counsel, as aforesaid, I signed the names of the said witnesses to their respective depositions, and I hereby certify that *that* the paper hereto attached and marked "Complainants' Exhibit M" was offered in evidence and by me attached to this deposition, and that the models markes "Complainants' Exhibit N" and "Complainants' Exhibit O" were offered in evidence and made part of these depositions and by me filed with but not attached to them; that the above depositions were taken without notice, by agreement of counsel of the respective parties, and that both complainant and respondent were represented at the taking of the said depositions and had opportunity for examination.

I do further certify that I am not relative or attorney of either party or otherwise interested in the event of this action.

185 In witness whereof I have hereunto set my hand and official seal this 16th day of February, A. D. 1885.

[SEAL.] A. C. DUSTIN,
Notary Public.

186 And afterwards, to wit, on the 21st day of February, A. D. 1885, a deposition was filed in this cause, which is in the words and figures following, to wit:

"Complainants' Exhibit M"

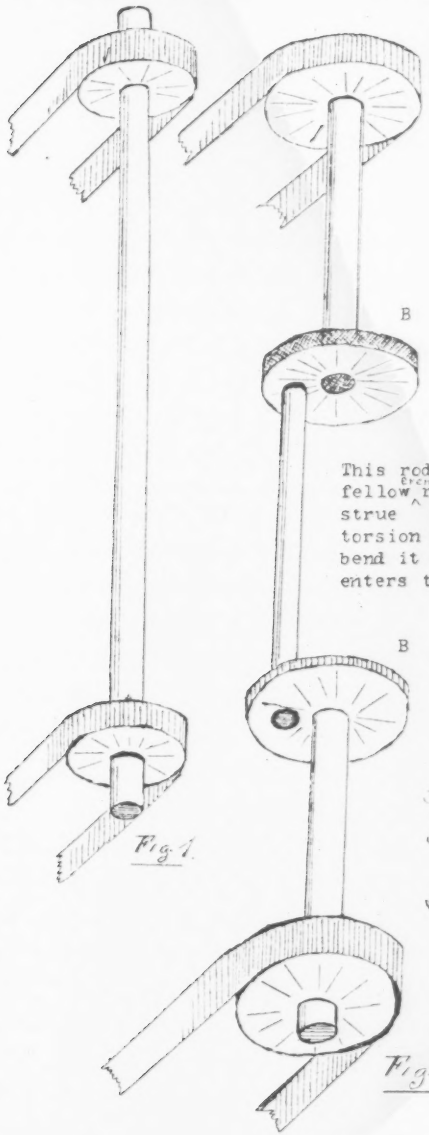


Fig. 1.

Fig. 2.

This rod is acted on as the Stringfellow Archer rod would be and as I construe it, it would be under torsion and a leverage that would bend it at the points where it enters the two plates.

No 220 & 277
Topliff
&
Topliff et al.
} p. 183.

Depositions taken before me, Henry J. Davies, a notary public within and for the county of Cuyahoga, in the State of Ohio, pursuant to the agreement of counsel, on Tuesday, the 17th day of February, 1885, at the office of Boynton & Hale, at Cleveland, in said county, to be read in evidence on behalf of the respondent in an action pending in the circuit court of the United States for the northern district of Ohio, in which George H. Ely *et al.* are complainants and Isaac N. Topliff is respondent.

Present: Henry S. Sherman, Esq., on behalf of complainants, and Hon. Jno. C. Hale, on behalf of respondent.

WORCESTER R. WARNER, of lawful age, being by me first duly sworn, deposes and says as follows:

(By Judge HALE:)

Q. You stated generally in your former examination as to your business. You may now state the particular branch of the business in which you are engaged and the class of machinery that you are manufacturing.

A. We make a high grade of iron and brass working tools and special machinery and astronomical instruments.

Q. How long have you been engaged in that business?

A. We have been engaged in our present firm for four years.

Q. How long have you been engaged in the same class of business?

A. I think it is nineteen years.

Q. You have examined Respondent's Exhibits "A" and "B," have you not?

187 A. I have.

Q. Have you made any test as to the comparative torsion of the connecting rods of the two?

A. Yes, sir.

Q. When did you make those tests?

A. I made them yesterday.

Q. Can you explain in what manner and how you made your test?

Objected to.

A. Yes, sir. Standing at the side of the test model, "Respondent's Exhibit H," marked "front," the rod at the left hand of this testing frame or experimental model represents and is the identical rod shown in respondent's "Model A," a straight connecting rod; and the rod on the right hand represents a full-sized rod like respondent's "Model B," the difference between the two being that respondent's "Model A" shows a straight connecting rod, a continuation of the bearing for the clips, and the respondent's "Model B" shows a connecting rod joined to both ends of the shackle and running centrally between them. Both of these models have one end fastened rigidly to the testing frame, so as to enable us to get the torsion on the other end. I will put this heavy steel rod marked

"Respondent's Exhibit L" in here. It is grooved so as to have the lever exactly the same length in each case. I will put this heavy steel rod in here like this, and then by this perpendicular guage you can see how far by the weight of this rod the shackle is bent down by the torsion of the connecting rod. So I hold this until I see that that just begins to bear, and here is a mark on this guage showing where it begins. I let it go by its own weight.

188 Then by measuring the amount that the weight of this steel rod "Exhibit L" compels it to fall at the point on this guage I get the torsion of the rod, which in this case is, roughly, seven inches and a half. Exactly the same conditions are met as I reverse it and put it on the rod on the other side, "Respondent's Exhibit J." I let it down where it pleases, and instead of seven inches and a half it falls only seven inches—a little less than that, in fact. The reason is evident—that both these connecting rods running from this shackle down and joining at this point are stiffer than if they came straight, and it really makes the rod here of only so much less length; in this instance some five inches less length, on which there is a torsion, than in the other case. Consequently it is even stiffer than the rod representing respondent's "Model A."

Q. Having made your test, in which do you say, in practical use, there is the more torsion—the connecting rod as used in Respondent's "Exhibit A," or the shaft or connecting rod as used in Respondent's "Exhibit B"?

Objected to.

A. In practical use there would be very little difference between the connecting rods in the two, but the stiffer of the two rods would be Respondent's "Exhibit B," for the reason I have indicated.

Q. To bring about the same result, so far as torsion is concerned, which would have to be the larger of the two, if either?

Objected to.

A. There would be practically no difference.

Q. What effect would the bending of the connecting rod, as used in Respondent's "Exhibit A," have upon the torsion of the rod?

Objected to as incompetent and immaterial.

189 A. The bending of the rod to what decree?

Q. To the degree shown in Defendant's "Exhibit B."

A. It would make no difference whatever. It would have no effect whatever.

Q. Can you show by actual test the effect upon the torsion of the rod of bending it to substantially the form shown in Respondent's "Exhibit B"?

Objected to.

A. Yes, sir.

Q. You may do so.

Objected to.

A. The rod, "Exhibit I," on the left of the testing frame represents and is an identical connecting rod and shackle of Respondent's "Exhibit A," and with this testing bar I will begin just where it first has an effect at the mark on this *guage*. I let the weight of this rod come down, give it all the tension it pleases. I measure the amount at the *guage* that it has dropped, and I find it seven inches and a half in the rough—seven inches and three-quarters—anywhere along there. We will call it seven inches and a half. Now exactly the same conditions will be met on the other side. It begins at the point which is marked here, and here you have seven inches and a half, just the same as before, showing clearly that the bending of the rod as shown, equivalent to Defendant's "Exhibit B," makes no difference whatever in the torsion, these rods both being exactly the same size.

Q. What is your conclusion, then, as to the comparative torsion of the three different rods that you have used in this experiment?

Objected to.

190 A. They are virtually the same. The one having the two arms like Respondent's "Exhibit B" is a little stronger, but they are virtually the same.

Q. What difference in principle or effect is there, in practical use, in using the rod "Exhibit I" and using the rod "Exhibit K"?

A. There is no difference whatever.

Q. And can you explain why?

A. There is no reason why there should be. The conditions of the strain are not affected in the least by the be*d*ning of the rod. The power applied to the end of this rod "Exhibit K" is communicated to the other end directly by the rod, whether it is straight or crooked. It communicates the motion given to the end where the power is applied to the other end, minus its torsion.

Q. The bending of the rod has no effect whatever upon the principle involved, as I understand?

A. It has no effect whatever, as the test has just shown.

Q. Is it true that the bending of the rod would require an increased weight to bring about the same effect?

A. It is not.

Cross-examination by Mr. SHERMAN:

Q. You mean to say that you can communicate power from one point to another by means of a crooked shaft as well as you can by a straight shaft?

A. Bent within certain limits; yes, sir.

Q. Then there must be a certain limit?

A. Yes, sir.

191 Q. What is that limit in mechanics, without reference to the model?

A. I cannot answer that. The part of the rod "Exhibit K" that is bent, we will say, is two inches here and two inches at this end and is virtually stronger than if it was straight by the power applied as it is now, so that that in itself would have a tendency to make

"Exhibit K" stiffer than if it was straight. The fact of it being bent at all off of its center, if extended indefinitely——

Q. Say eighteen inches.

A. Eighteen inches—instead of a torsional strain it would be to give a bending strain, which in this case, by the limits shown in the models, would be more than counteracted by the increased rigidity of this bend at this place; so there one eliminates the other and gives us the same test.

Q. What is the principle of the rod in Respondent's "Exhibit B"? Is that a shaft?

A. It is — shaft; yes; it is a connecting rod.

Q. It is not a crank?

A. No, sir.

Q. There is not a crank about this motion at all?

A. No, sir.

Q. Supposing this revolved around and around, what would you call it; would it be a shaft or a crank?

A. There can be no crank without a shaft.

Q. Supposing you cut the rod in Respondent's "Exhibit B" off in the center and used it to revolve, what would you call it?

A. You would call it a crank.

Q. A crank or a crank pin?

192 A. You would call it a crank pin.

Q. Supposing the two shackles were wheels, what is this rod that would connect them outside of the center of the wheels, as shown in "Exhibit B," a shaft or a crank pin?

A. In that case it would be a crank pin.

Q. Supposing these rivets in Respondent's "Exhibit B" were extended until they met each other, what would that become, a shaft or a crank pin?

A. It would be a shaft.

Q. Mechanically speaking, what is the difference between a crank pin and a shaft, if any? Are they distinct or are they similar things in mechanics?

A. Ordinarily speaking, in mechanics a crank pin goes about a shaft connected by a crank.

Q. But is it similar or different?

A. It is different.

Q. Entirely different, is it not, from the shaft?

A. It may communicate motion just the same.

Q. I am not asking that. I am asking as a mechanical device.

A. Yes, sir; we know them by different terms.

Q. And you know that they are distinct and different things in mechanics, do you not?

A. Yes, sir.

Q. A crank pin revolves outside of the center of motion, does it not?

A. Yes, sir.

Q. And a shaft turns around its own center of motion?

A. Its own center; yes, sir.

Q. When you have — shaft and you bend it down—give it de-

flection—what do you call this part outside of the center of motion?

193 A. We call it a crooked connecting rod.

Q. What do you call it in mechanics—a shaft or a crank pin?

A. If it made a complete revolution around its center, we would call it a crank pin.

Q. The moment you bend it outside of the center of motion you get a crank pin, do you not?

A. Yes, sir.

Q. Have you ever tried the equalizing of springs practically by means of a bent rod, as shown in "Exhibit K," on a buggy?

A. No, sir.

Q. Then, so far as your practical knowledge goes, you do not know?

A. I am not a carriage-maker; no, sir.

Q. In attempting to communicate motion by a crank pin from one point to another the success would depend largely upon the stiffness or rigidity of the crank pin, would it not?

A. In practical mechanics the crank pin is almost always smaller than the shaft which it connects.

Q. I am not speaking of that. In communicating power from one point to another by means of a double crank pin or a crank pin, it would be double crank pin then, would it not?

A. It would be a crank pin attached by two cranks, you mean.

Q. In communicating power from one point to another by means of a double crank pin the success or failure of that transmission of power would depend not only upon the rigidity of the rod, but upon the distance between the two points, would it not?

A. It would; yes, sir.

Q. And the farther the point to which you wish to communicate the power from the other the greater the liability of that

194 crank pin to bend?

A. True; yes, sir.

Q. In communicating power by means of a shaft has the distance anything to do with it?

A. It is just exactly the same as with the crank pin, as we have shown by the test.

Q. Suppose you wish to communicate power from one side of this room to the other by means of a shaft, and you have a shaft that will successfully do that. Do I understand you to say that exactly the same size and weight of metal in a crank pin will communicate the same power with the power communicated at one end and transmitted to the other, the extreme end?

A. I do, within certain limits.

Q. What limit would you put to that as a mechanic? Say the distance was eighteen feet, how far from the center of motion can you put that crank pin to communicate the same power that you get through the shaft?

A. That would only be an estimate; but it could only be a small limit to any such extent as that, certainly.

Q. Would twelve inches be too much?

A. Oh, yes, you could not do it.

Q. Would two inches be too much?

A. Two inches with rigid connecting rods.

Q. Having the same connecting rod exactly?

A. You do not have any connecting rod with the straight shaft. Of course, to take the shaft off of its center of motion you must have a crank there then to attach it. Then I would say it would be better to go straight, but two inches would not do any harm,

Q. You think, then, that in a space of eighteen feet the
195 same size of crank pin that you have of shaft would communicate the same amount of power from one end to the other?

A. Not to such good advantage; no, sir.

Q. The power would not be communicated, mechanically speaking, in the same way, would it?

A. No, sir.

Q. It would be communicated by means of a double crank pin and not by a shaft, would it not?

A. We never should call any such thing a crank pin.

Q. A beam, then; you know what a beam is?

A. Yes; we should call it being communicated by an eccentric shaft, and an eccentric shaft is virtually a crank.

Q. Crank pin, crank beam, or crank lever, whatever you mechanics call it?

A. Yes, sir.

Q. Which is the better method of communicating motion, by an eccentric shaft or by a straight shaft?

Objected to.

A. In practical machine construction we choose the straight shaft wherever we can.

Q. Have you ever tested practically the amount of power that is conveyed by a device similar to that shown in Respondent's "Exhibit B" from one spring to the other?

A. No, sir; I have made no tests with springs.

Q. These three rods, "Exhibits I, J, and K," are of the same size?

A. Yes, sir.

Q. All the way through?

A. Except in the welding on that first one. It is stronger at the weld necessarily, but they are made of the same kind of
196 rod.

Q. Would that increase of size where it is welded make any difference in the result?

A. Yes, sir; it is the same as increasing the size all the way along. I mean it has the same effect at the point of welding as if it was proportionately increased all the way along.

Q. Then you would say that "Exhibit J" is a larger rod than "Exhibit K"?

A. No, sir; it is a shorter rod of the same size. It is strengthened by having this joint come at both ends of the shackle.

Q. What difference does it make to shorten the rod? Do you get increased power from it?

A. You get decreased torsion in shortening all rods.

Q. And increased power?

A. There is no power anyway.

Q. I mean the ability to transmit power?

A. It is greater on short rods.

Q. So that there would be a greater ability in the rod "Exhibit J" to transmit power than there would be in "Exhibit I" or "Exhibit K"?

A. There is, yes; or a greater ability on respondent's "Model B" to transmit power than on "Model A."

Q. In making these tests with this test model, "Exhibit H," have you applied your tests up to the bending or breaking point of the rods?

A. No, sir.

Q. You have made no test of that kind?

A. No test beyond what you have seen here.

197 Q. You have not made an actual test to ascertain whether "Exhibit I," "J," or "K" will bend or break first?

A. No, sir.

Q. Would you say that the weight that you have applied in the exporiments you have made would be equal to 175 or 200 pounds' weight on a side spring? Have you tested that?

A. I have not tested that at all.

Q. Mechanically speaking, a straight shaft gives it full value, does it not, in transmitting power, decreased only, perhaps, by the effect of the bearings? Is not that true?

A. Yes, sir.

Q. Is it not true that an eccentric shaft or double crank pin gives simply an amount proportionate to its stiffness?

A. All rods give an amount in proportion to their stiffness.

Q. And in proportion to their length?

A. And in proportion to their length.

Q. Is it the same proportion?

A. In an eccentric shaft it would be less under the same circumstances.

Q. And the greater length you would give to it, the greater the disproportion of power conveyed? Is not that so?

A. The power conveyed is less as you increase the length, whether it is eccentric or str-ight, in either case.

Q. And in the same ratio, mechanically speaking?

A. No, sir. The construction, as shown both in Respondent's "Exhibit B" and in Respondent's "Exhibit K," shows a part of this connecting rod to be the crank itself, and the rest, as you place it, the crank pin. The part that is the crank itself is stiffer than if it had been straight. That reduces the length of the part that

198 is the crank pin and eliminates the increased tendency that is due to it being eccentric, and for that reason in Re-

spondent's "Exhibit B" and Respondent's "Exhibit K" we have the same results by means of the tests.

Q. Now what do you say to my proportions, as a general proposition?

A. As a general proposition, without any conditions?

Q. Yes.

A. The disproportion (that is not the word I want to use, either, hardly) would increase greater with a crank pin than with a straight shaft.

Q. The ratio between the two, if they are of the same size, would depend, would it not, upon the ratio of the size to the length?

A. It would depend on the eccentricity of the eccentric shaft.

Q. And the further you get away from the center of motion with your connecting rod, the less power there would be to transmit motion?

A. That is true.

Q. Where, in a straight shaft, outside of the friction due to the bearings, etc., is there any loss of power?

A. There is no loss of power anywhere.

Q. It communicates all the power that is applied to one end of it to the other, except what may be taken up by the friction in the bearings. Is not that so, in a straight shaft?

A. In a straight shaft, by revolving it?

Q. Yes.

A. It must, or else it could not revolve.

Q. (Question repeated.)

A. That is true.

Q. Take a connecting tie-rod or bar as shown in Re-
199 spondent's "Exhibit B." In other words, take a double crank pin as there shown and state whether all the power that is communicated at one end by depressing the spring is communicated to the spring on the other side without any loss except the friction at the top of the C-shaped jacks.

A. Referring to Respondent's "Exhibit B," I should say that on account of the increased rigidity at the forks all the tendency for—not for torsion, which would be the same in either case, but all the tendency for a direct bend of the shaft is eliminated, and the shaft would communicate the motion just as well as if it was straight at either end of the shackle. That is due to the fact that it is shorter where the real torsion comes. It is shorter by the amount taken up by the fork, and, of course, the shorter any of these shafts are the less the torsion.

Q. Why is it that in "Exhibit B" little or no motion is shown to be communicated, if it can be communicated as constructed?

A. Because the motion due to the weight in the body comes upon the shackles in a perpendicular line, or nearly so; consequently it cannot go down. The only motion communicated to the shackles is due to the elongation of the spring; whereas, if constructed with a spring, proportionately short, as in Respondent's "Exhibit B."

Q. I am not asking how you could construct it, but simply why it is not there.

A. Because the motion is communicated in a perpendicular line with the shackles.

Q. You have examined the Stringfellow and Surles patent and the drawings?

A. I have.

200 Q. Do not that drawing and that patent show that the shackles are to be perpendicular? In other words, is not Respondent's "Exhibit B" constructed substantially in accordance with the patent and drawings of Stringfellow?

A. Substantially; yes, sir.

Q. Then, as constructed in "Exhibit B," there would be little or no motion shown as being communicated from one side to the other?

A. There is little or no motion to be communicated. It communicates what there is, minus the torsion, but there is little to be communicated.

Q. What you have testified to in relation to the power to communicate in rods "I," "J," and "K" is the result of your theory without having been actually tested in use on a buggy?

A. It is the result of testing with this testing machine.

Q. If rod "J" were clamped down to the body of this frame as it is on a buggy would it make any difference in the result of the test you have applied to it?

A. Not in the least.

Q. And the same with the other three rods?

A. The same? Not in the least.

Q. If this clamp by which you fasten the rod to the frame were placed right over the center of motion along the line of the shaft it would make no difference?

A. No difference whatever.

Q. And the same with the others?

A. The same. The shackles are simply held rigid.

Redirect examination:

Q. Supposing the springs in Respondent's "Exhibit B"
201 were shortened so as to bring the shackle up to the oblique position as shown in "Exhibit A," then would the result produced by the two be the same or different?

Objected to.

A. It would be just the same.

Q. In the distance between the two springs of an ordinary buggy is there any difference between the use of a straight shaft, in the power to communicate motion, and the use of the crank pin, as shown by "Exhibit B"?

Objected to.

A. No, sir; there would be no practical difference; they are virtually the same.

Recross-examination:

Q. You say there would be no practical difference. Have you ever tried it?
A. Only by this testing machine.
Q. You mean theoretically, then?
A. This is practical.
Q. Have you made any practical test with springs in a buggy?
A. No, sir.

Redirect examination:

Q. Are not these rods that you have used in making this test of the same length as rods that are ordinarily used in a buggy?
A. Yes, sir; just the same length.
Q. Are they not of the same size?
A. They are of the same size. The*t* are the identical pieces that are used in buggies.
Q. The same conditions?
202 A. The same conditions.

Recross-examination:

Q. That is, you have been told so?
A. It is a question of fact, not of opinion.
Q. Do you know it as a fact that they are of the same size?
A. Yes, sir; these were taken from stock.

Redirect examination:

Q. They were taken from the stock and "Exhibit I" is as they use them, and "Exhibit K" is the same thing bent?
A. Exactly, sir; that is so.
Q. And of the same length and all?
A. Same length, same material.
Q. So your test has been of the rod as actually used in the carriage?

Objected to.

A. It has.
Q. Comparing "Exhibit K" and "Exhibit J" with the rod that is used in the actual manufacture of a buggy?
A. It is so.

Objected to.

Recross-examination:

Q. In your test you have not fastened the rods to the frame as they are fastened in a buggy, have you?
A. They are not fastened as they are in a buggy?

Redirect examination:

Q. They are in the same condition, so far as transmitting power from one end to the other is concerned, as in a buggy, are they not?

Objected to.

203 A. They are.

For the purpose of illustrating the comparative torfion of the rods, respondent introduces in evidence model marked "Respondent's Exhibit M."

Complainants object to the introduction of said model generally, and also on the ground that the order of the court under which this testimony is taken does not include anything of the kind.

Q. What is this (referring to "Respondent's Exhibit M")? Will you explain what is indicated or shown by it?

Objected to.

A. It is the same as Respondent's "Exhibit B."

Q. What do you say as to the comparative torsion on the connecting rod in this and in the device shown by "Exhibit A"?

Objected to.

A. They are practically the same.

Q. What change, if any, would have to be made in this to make it exactly the same as "Exhibit A"?

Objected to.

A. You would have to have the proportional length of the springs with the bearings of the shackles the same as in "Exhibit A."

Q. Can you show that?

Objected to.

A. I can. I can show it by bringing the bearings of the outer part of the shackles farther apart, so as to make the proportional length of the springs to the distance of those parts the same as in "Exhibit A." Then it will have exactly the same motion.

Q. With the extension that you have shown now by the model and in that shape, how does the torsion upon the connecting
204 rod compare with the device shown by "Exhibit A"?

Objected to.

A. It is practically the same.

Q. How does the motion of the two compare?

Objected to.

A. Practically the same.

Recross-examination:

Q. How does "Exhibit M" compare in size with "Exhibit B"?

A. It is nearly the same size.

Q. How does the connecting rod compare with the connecting rod in "Exhibit B"?

A. The connecting rod in "Exhibit M" is a half inch and in "Exhibit B" it is fifteen-thirty-seconds.

Q. How do the two rods compare in length?

A. Nine inches in "Exhibit M" and eleven inches in "Exhibit B."

Q. How do the forked ends compare in size, weight, and thickness?

A. They are heavier in "Exhibit M."

Q. How does the length of the links compare in the two exhibits?

A. The length of the links or shackles in "Exhibit M" is just the same as of those used on a carriage.

Q. How do they compare in the two models?

A. As two to two and three-fourths inches.

Q. Let me ask you whether in "Exhibit M" there is shown a straight shaft or connecting rod having rigid arms attached to it.

A. There is shown a straight shaft having rigid arms connected with it.

Q. A shaft straight from one end to the other?

A. The arms are forged upon it, which makes it crooked
205 on each end.

Q. How many arms are upon it?

A. Two.

Q. Then the shaft is crooked at each end?

A. The shackle is crooked at each end.

Q. How many arms are forged on the shaft?

A. Two on each end.

Q. Are the two arms running out parallel or does one come up on one side of the shaft and one on the other?

A. They are on opposite sides.

Q. What would you say the principle of that operation was there, a shaft or a crank bar or beam?

A. We should call it a shaft—a connecting shaft.

Q. There is nothing of the crank bar or beam in that model?

A. Yes, sir.

Q. Mechanically speaking, then, what is it—a crank pin or beam, or is it a shaft?

A. It is a shaft; it is a crank pin.

Q. I am speaking now of what you would call it as a mechanic.

A. I would call it a shaft.

Q. There is nothing of the crank pin in it, is there?

A. Yes; from the fact that in moving it swings upon the center of one end of these arms, it might be called a crank.

Q. How does a shaft move, mechanically speaking?

A. In a thousand ways.

Q. How does a shaft move—around its own center or around the center of something else?

A. In various ways. We have machines where they move in a dozen different ways.

Q. Have you what is known mechanically as a straight
206 shaft that moves around anything but its own center?

A. Oh, yes, sir; it is so in all knitting machines. There are thousands, not only around its center, but around other centers, in combination.

Q. At the same time, by the same movement?

A. In all sorts of combinations. It may move around its own centre and no other; it may move around its own center and an-

other at the same time. It may move around a dozen centers at the same time. It may move around its own center and at the same time around another center, and still around a third, just the same as the planets move in the heavens.

Q. It must move around its own center in operation?

A. Not necessarily.

Q. To communicate motion from one point to another must it not necessarily move around its own center?

A. It must, certainly.

Q. Where in "Exhibit M" does that which you call a shaft in communicating motion move around its own center?

A. Just the same as our moon revolves around its own center in going around the earth—exactly that planetary motion.

Q. That shaft moves around its own center?

A. Exactly the same; yes, sir.

Redirect examination:

Q. Supposing "Exhibit B" were cut in two and spread apart, as shown in "Exhibit M," would the result be the same or different?

Objected to.

A. Exactly the same.

Q. The difference in the size of the rods and the length of
207 the shackles, to which your attention has been called, would play no part in its effect?

Objected to.

A. No, sir; from the fact that they are all stiffer, they are all more rigid than would be affected by the tests we give them, by any hand pressure we give them. If this was two inches in diameter it would be just the same, because even the lighest model you have here is sufficiently strong, so that there is practically no torsion to it.

(By Mr. SHERMAN:)

Q. Then you think that the size of the rod plays no part at all?

A. Oh, no, indeed, sir. I say your lighest rod here is sufficiently strong, so there is no torsion. When you get beyond that the size does not do you any good—you are not benefited by the size. It does make a difference whether it is straight or crooked. I am speaking of the model now.

(By Judge HALE:)

Q. No difference as to the model after you overcome the torsion?

A. Exactly; and that is strong enough in your lightest model.

WORCESTER R. WARNER.

208 C. G. FORCE, of lawful age, being by me first duly sworn, deposes and says as follows:

(By Judge HALE:)

Q. What is your business?

A. Civil and mechanical engineer.

Q. What education in that line have you had?

A. I have practised for the last eighteen years. During a good portion of that time I gave especial attention to patent causes in this city.

Q. In what particular department have you b-en engaged during some portion of that time?

A. In the city engineer's department as civil engineer. During the past six years previous to last spring my practice was a general practice here in the city and largely in expert testimony in patent causes.

Q. Have you ever been connected with the King Bride Company?

A. Yes; I was engineer of the King Bride Company for two years.

Q. What is your present official position?

A. City civil engineer.

Q. How long have you been in that position?

A. Since last spring.

Q. Will you examine Respondent's "Exhibit A" and Respondent's "Exhibit B" and state what in practical use would be the difference, if any, in the torsion of the two rods connecting the springs? And give any reasons that you have for the result you arrive at.

Objected to.

A. As to transmitting torsion, they would be substantially the same. I would add that in nature there are certain laws
209 which all the crookedness and twisting of man cannot circumvent, and the case here is in point. Here are certain laws of nature depending upon power applied, the distance between the points to which it is to be applied, and certain leverages that govern this case. God Almighty made them and man cannot change them. You may twist these rods around as much as you are a mind to; you cannot vary those laws of nature depending upon leverage, power applied, and distance apart. Now, I cannot see that in this case there is any change of those natural laws at all—in fact, this experiment here that I have witnessed shows that distinctly, if I did not already know it. A mechanic ought to know it without experimenting. In this "Exhibit B" this shackle hangs nearly vertical, whereas in "Exhibit A" it is almost horizontal; so that the only vertical motion with any weight on these springs would be due to the deflection of the spring, as this lower end of the shackle cannot get any lower than the length, whereas in "Exhibit B" a load applied to the spring not only deflects the spring itself, but the point of loading—that is, the end of the shackle—also turns

and passes lower—drops lower because it turns, whereas the shackle in "Exhibit B" hangs almost vertical naturally.

Q. Hanging "Exhibit B" in a position similar to that shown in "Exhibit A," what would be the result?

Objected to.

A. You would have sub-*at*ntially the same results. The two would give substantially the same results.

Q. Is there any necessity, to bring about that result, of making one larger than the other? Is there any torsion upon the
210 one more than upon the other that would require an increased size or weight?

Objected to.

A. If any difference I should say that the str-ight rod would have to be heavier—that is, the rod shown in "Exhibit A" would have to be heavier than the rod that is shown in "Exhibit B."

Q. Why?

Objected to.

A. Because it is longer and the torsion is greater, as the length of the rod communicating it is greater, and in "Exhibit A" the length of the ro*f* is sub-*at*nta*i*lly longer—that is, the length that is subject to torsion. The length — has its greatest torsion, we will say, is longer tha*t* in "Exhibit B;" consequently it would twist more.

Q. Take these two rods that have been introduced to-day, "Exhibit I" and "Exhibit K," are those rods of the same size?

Objected to.

A. To the eye, yes. I have not measured them. I will measure them. They are of the same size. "Exhibit J" is also the same size. It is just a shade larger, I should say.

Q. Does the form of the two rods, "Exhibit I" and "Exhibit K," have any effect upon the power of either to communicate motion?

Objected to.

A. You mean the bending?

Q. The bending, yes.

A. Within the limits shown sub-*at*nta*i*lly none. Substantially no difference with- the limits shown.

Q. And within the limits shown in Respondent's "Exhibit B" what would be the result?

Objected to.

211 A. Substantially no difference. I would add that "Exhibit B" is stiffer than "A"—that is, the rod. The shaft connecting the shackles on "Exhibit B" is stiffer, being the same size and length between springs as Exhibit "A"—is stiffer on account of its difference in length. The practical result of the shape of the shaft on "Exhibit B" is to shorten it; consequently it is stiffer than the shaft in "Exhibit A."

Q. Suppose the springs in "Exhibit B" were shortened so as to bring the shackles into the oblique position shown in "Exhibit A."

Objected to.

A. There would be the same result substantially and the same torsion on the shafts—the same torsion on the shaft, other things being the same, the conditions being equal.

Q. And the ability to communicate power from one to the other.

Objected to.

A. It would be the same. In other words, as I said in a former answer, the laws of nature that govern this question are not varied by the twisting or bending of these shafts. A certain leverage is here, and if those same conditions are used in different shapes it does not change those results. It does not change that torsion at all. This experiment here showed that conclusively.

Q. Did you witness the experiment made with the testing machine?

A. Yes; I stood by and witnessed it. It is just what a theoretical man would say would be shown.

Q. What do you say as to that test being a practical test?

Objected to.

A. I should say that the shaft "Exhibit I" and the shaft "Exhibit K" and the bar and the application and the whole ex-
212 periment put these different pieces in substantially the same conditions that they are in in use on a buggy, as shown in these exhibits, "A" and "B."

Q. And it would be a practical test of the result that would follow in actual use?

Objected to.

A. I should consider it a very practical test and a satisfactory test.

Cross-examination by Mr. SHERMAN:

Q. You say that the ability of the two rods to convey the same power would be the same within certain limits. Where do you fix those limits?

A. I do not fix them.

Q. Approximately, within what limits? Would you say a bend of ten feet or one inch?

A. I should say the limits would be between those.

Q. Where between?

A. I cannot tell.

Q. In a rod two feet long would you say that six inches was out of the way?

A. It might affect it.

Q. Would you say that three inches would?

A. I am only guessing at that.

Q. A half inch might affect it, then?

A. I should not think it would.
Q. Would three-quarters of an inch?
A. I do not think it would.
Q. One inch?
A. I do not think it would.
213 Q. Two inches?
A. I do not think that two inches would.
Q. Three inches?
A. I do not think that three inches would. I do not think you could notice the difference.
Q. How about six inches?
A. It might then. It would depend in that case upon conditions. It would depend upon the shape and the welds, etc. For instance, in Respondent's "Exhibit B," where these two branches of this shaft are welded, it would be stiffer.
Q. So, without an actual experiment, you would not be willing to say just what those limits were?
A. I would not be willing to put them down to a narrow limit?
Q. What do you call this (referring to "Exhibit B")?
A. I should call it a shackle. I do not see much force to your defination of a double crank pin.
Q. What would — call it, mecha-ically speaking, supposing these on each side of "Exhibit B" were wheels instead of shackles, and this bar was put across here to communicate power?
A. You will have to narrow that question down to some point or else it does not mean much.
Q. Suppose that this was the center of motion of a wheel whose diameter was equal to twice what you call the shackle. What would you call the bar that connected those two wheels? If you intended to revolve these wheels by means of this rod, what would you call it—a shaft or a crank pin?
A. You could call it either. It is an overdrawn case. You are overdrawing the whole case.
Q. I am assuming this now.
A. Well, I say you are assuming an overdrawn case.
214 Q. Whether it is overdrawn or not, what do you call it in mechanics?
A. You could call it a bar, you could call it a shaft, or you could call it a crank pin.
Q. Would this bar, under those conditions, be what is known in mechanics as a shaft revolving around its own center of motion?
A. Yes; it would.
Q. This rod revolves around its own center of motion?
A. No; it would not be revolving around its own center of motion in one sense; in another sense it would.
Q. In what sense would it?
A. In the sense that when a man walks around a tree he turns once around.
Q. As a mechanic, you say in that sense it does?
A. Yes, sir.
Q. How long have you been engaged as a patent expert?

A. I have not done anything at it since last spring.

Q. How much of your time or attention has been given to testifying as an expert in patent cases?

A. During the term, we will say, of ten years previous to last spring.

Q. (Referring to model.) You described these in your examination-in-chief as shackles hanging nearly perpendicularly from the C-shaped jacks, did you not?

A. Yes.

Q. Look at Respondent's "Exhibit A" and state what you call, mechanically speaking, the bars rigidly attached to the end of the shaft at each end.

A. That is what we call a shackle also, mechanically called
215 a shackle.

Q. Would a mechanic call that a shackle?

A. Yes; he might. He could call it a shackle or call it a crank.

Q. Is "shackle" a proper term for it?

A. Yes; it is a proper term in one sense.

Q. What sense is that—a very loose sense, is it not?

A. Well, no; that is a shackle.

Q. Let me ask you whether in mechanics a shackle is not known as a piece of metal or other material that is not rigidly attached to a shaft or bar, but that falls loose?

A. Not necessarily. In that case ("Exhibit B") it is rigidly attached.

Q. I am asking you now whether it is not known as a piece of metal or other material that runs loose.

A. Not necessarily.

Q. As a mechanic you say it is not?

A. Not necessarily, I say.

Q. Do you say it is not?

A. I say not necessarily; not necessarily loose.

Q. Then you say, as a mechanic, that is a shackle (referring to "Exhibit A")?

A. Yes; I should call it a shackle; that is one name for it. There is no inconsistency in calling it a shackle.

Q. I will ask you, as an expert mechanic, whether a crank pin or beam is the same thing in mechanics as a shaft.

A. It depends upon conditions. Considering that ("Exhibit B") in the sense in which you put your question some time ago and lengthening it out and disproportioning it in the sense that
216 you attempted to put it in here, it would be called a crank pin or a bar or a shaft. You have overdrawn that part, in other words. There is a limit between definitions which you can so overdraw that it makes them incongruous. I say that in this case, referring to "Exhibit B," you have so overdrawn that that it becomes incongruous. You have so distorted—so overdrawn it—that it could be called a crank pin or could be called a bar or could be called a shaft.

Q. Let me ask you whether a crank pin and a shaft are used interconvertibly in mechanics.

A. I answer to that question that it depends upon conditions.

Q. I am not naming any conditions. Answer the question.

(Question repeated.)

A. That depends upon conditions, I repeat. I say that a crank pin could be so lengthened out, could be so distorted, that it might be called a shaft with propriety or a bar. At the same time it would be a crank pin.

Q. That is your answer, is it?

A. That is my answer.

Q. I will ask you whether a shaft and a crank pin or a crank beam or crank lever are known in mechanics as the equivalents one of the other.

A. Yes.

Q. They are?

A. Yes; anything that would answer the purpose of that—substantially that purpose.

Q. In every case where a shaft is used a crank pin can be substituted for it and used?

A. No; I do not say that.

Q. Then will you please explain what you mean by an
217 equivalent in mechanics?

A. I mean something that can be used for substantially the same purpose, to produce the same result in substantially the same way.

Q. In every case, then, as I understand you, in mechanics, where a shaft can be used you can use a crank pin or beam to accomplish the same purpose?

A. I said no such thing, and I do not say any such thing now.

Q. Let us understand what you do mean by that.

A. I said that you could so lengthen a crank pin, so overstate it, so make it incongruous, that it would hardly be recognized as a crank pin; you could call it a shaft or you could call it a bar.

Q. And that is your answer to my question whether those two are equivalents, is it?

A. I said they were not equivalents. You could take that crank pin and make — *saft* of it.

Q. In every case, then, as I understand you, in mechanics, where a shaft can be used you can use a crank pin or beam to accomplish the same purpose?

A. No; I do not think you could.

Q. Then it would be only under certain conditions that you could use one for the other. Do I understand you thus?

A. I mean the principle would be the same, if that is what you want me to say. The principle of a crank pin would be the same in either case; but I said you could so distort it, you could so lengthen it, that it would hardly be recognized as a crank pin.

Q. But still it would be a crank pin, would it not?

218 A. In principle; yes.

Q. State whether, in your experience as a mechanic, where it was desired simply to convey power from one point to another

point, you have seen the use of a crank pin instead of a shaft for that purpose.

A. In this "Exhibit B"?

Q. Ou-side of "Exhibit B."

A. Take "Exhibit A," then—something that we can talk about and look at.

Q. No; I am asking where you have ever seen it done.

A. I will point to "Exhibit B."

Q. I am speaking of outside of "Exhibit B."

A. I will point to "Exhibit A" or I will refer to any buggy using those. Part of that shackle could be called a crank pin or could be called a shackle, as I said in my previous answer.

Q. (Question repeated.)

A. I am answering now in reference to the supposition that you made.

Q. (Question repeated.)

A. I have seen them used in conjunction.

Q. (Question repeated.)

A. I have seen them used in conjunction for conveying power, and have seen shafts used without cranks.

Q. (Question repeated.)

A. I have seen them both used. I have seen them used singly and in conjunction for that purpose.

Q. Please state where you have seen a crank pin or bar used simply to convey power between two points, outside of any model that you may see here.

A. In any steam-engine you may see it. It is one of the links in the connection.

219 Redirect examination:

Q. Within the limits as shown by "Exhibit A" and "Exhibit B," what is the difference in the two devices as to the crank pin or direct shaft?

Objected to.

A. Substantially no difference.

C. G. FORCE.

Certificate waived. Depositions signed by notary by consent.

[SEAL.] HENRY J. DAVIES,
Notary Public.

Tax notary fees for taking depositions in short-hand and copying same, 84 folios at 15 cents, $12.60

Deposition endorsed as follows: "4289. U. S. circuit court, nor. district of Ohio. Topliff & Ely *vs.* I. N. Topliff. Deposition on behalf of respondent. Filed Feb. 21, 1885. A. J. Ricks, clerk U. S. circuit court."

220 And afterward, to wit, on the 26th day of February, A. D. 1885, a deposition was filed in this cause, which is in the words and figures following, to wit:

Depositions taken before me, A. C. Dustin, a notary public within and for the county of Cuyahoga and State of Ohio, at the time and place therein specified, to be read in evidence on behalf of the complainants in an action pending in the circuit court of the United States for the northern district of Ohio, eastern division, wherein John A. Topliff and George H. Ely are complainants and Isaac N. Topliff is respondent.

Present on behalf of complainants: Henry S. Sherman, Esq.
Present on behalf of respondent: Hon. John C. Hale.

No. 4289.

ALEXANDER E. BROWN, of lawful age, being by me first duly sworn, as hereinafter certified, deposes and says:

I wish to make the following corrections in my former deposition: In the 3rd line from the top on page 6 in my former deposition there appears the word "motion," and it should be "strain." Again on the same page, in the 18th and 20th lines from the top, there appears the words "motion," and it should be "strain." In the 8th line on the 7th page from the top the same correction should be made.

(By Mr. SHERMAN:)

Q. You testified in this case before?

A. Yes, sir.

221 Q. State whether you have examined Defendant's Model Exhibit H—a testing model—and the Exhibits I, K, L, and M.

A. I have.

Q. State what test you have made with any one of the models I, K, or L with reference to ascertaining the stiffness or rigidity or power to transmit motion in them.

A. I have tested "I," and took special pains to get it as nearly correct as possible with so rough an apparatus, and in order to do that I placed the rod first in the position that I call No. 1 as it is supposed to be in a buggy. This is the center of the axis of revolution, the rod or shaft being the axis of revolution. I put pins in the ends of the crank and fitted them as tightly as possible, so that there would be no lost motion in making the experiment, and I blocked the hole so as to make as little difference as possible due to the roughness of the model—that is, in other words, to make the model as perfect as I could in order to arrive at a correct result. I put the bearings on metal, so as not to press into the wood. This crank end at the left, as I hold the bar with the cranks from me, was clamped tightly to one side of the frame H. At the other side I placed the bearings on metal, so as to turn as nearly concentric with the center of axis as possible. In that position, in which it was tightly clamped, and with that strain on the free crank end, I placed the steel lever M in between the crank arms of one end of the shaft, so that it had a fair bearing on the journal and on the short pin connecting the two cranks without producing any strain

in the shaft—brought it just to a solid bearing; and with that in that position I marked on the *guage*-stick on the opposite end, or near the opposite end, the position of the bar M,
222 or rather its intersection with that *guage*. Next I allowed the weight of this bar alone to twist by torsion this shaft and then marked the deflection on this same *guage* with a knife edge. I then added a small weight of about a pound to the end of the lever M. This weight was suspended by a string from the fixed eye-bolt in the lever M. The position that the lever assumed by reason of the increased weight was also marked carefully on the *guage*-stick. After this experiment I reversed the conditions exactly of this same rod by putting a tightly fitting pin in the end of the crank arms at each end of the shaft I, and used these what were before the crank pins as the centers of oscillation for the second test. This was carefully adjusted to give as near an accurate and as fair a test as the former and as carefully as I could make it, being careful to have all bearings brought to their proper places. The one end was clamped to the frame H at one side, and the other, as before stated, was fixed so that what was formerly in the first experiment the crank pin was now the acting center. I placed the bar M in this same apparatus in this second position of "Exhibit I" so as to be brought just to a bearing the same as in experiment 1. In this position, what was formerly the shaft is in experiment 2 the crank pin connecting rigidly the two cranks at each end of the frame. Having placed this bar as stated, and marking the position of starting or bearing of no strain in "Exhibit I" and marking the position of intersection of lever M with the same standard or *guage* rod as before, I then allowed it to settle by its own weight to the natural position which it would assume and marked carefully the
223 intersection of the lever with the *guage*, being careful to have the conditions in this experiment exactly the same as they were in the other in respect to any discrepancies that might arise from bad manipulation. I then added the same weight as spoken of before in experiment 1 to the same eye-bolt in lever and under exactly the same conditions, and marked that deflection on the *guage*-stick as shown by the intersection of the lever with the *guage*-stick with the result that carries out, in a practical sense and what is actually the fact, the principles of the strains that should be shown due to these two experiments; and the result obtained, as theory and actual fact of mathematics will show, that no matter how small a distance from the center of oscillation, as shown in this exhibit and experiment, you move the shaft, the mechanism will be weaker in proportion to the distance that you remove it and change it from a shaft to the conditions of a crank pin. The reason of this is that in a shaft the stiffness varies directly as its length. Its strength has nothing to do with length whatever. In the condition of a crank pin the strains are different, and the crank pin acts in the sense of a beam supported at one end rigidly and loaded at the other. The stiffness of this beam varies in relation to its diameter the same as in the shaft as the cube of the diameter, but the stiffness of the beam varies inversely as the cube of the length instead

of as in the shaft directly as its length. Therefore, the moment that you move this bar out of its true center of oscillation, you commence by stages to weaken its stiffness. Again, the comparative
strength of the two conditions of a shaft and a crank pin
224 vary in the shaft only as the cube of the diameter, the length having nothing to do with its ultimate strength. The condition of the crank pin varies also with the cube of its diameter, but varies as the cube of its length multiplied by 4. From this it will be seen that the conditions of strain, the conditions of strength, and the conditions of rigidity of these two devices, the crank pin and the shaft, are different. The elements that are common to both being eliminated (which is the cube of their diameter for stiffness and strength), the remaining elements show that the longer the crank pin is made the weaker it becomes and the less stiff it becomes, while with the shaft the condition of length has nothing to do with its strength and its stiffness only varies as its length. Therefore from this it will be seen that these two mechanical devices are not the same, as they do not perform through the same mechanical strains or in the same mechanical degree under exactly the same conditions of comparison.

Q. Can you go on now and state from the experiment made with those two devices what is the relative strength of each, in the way of transmitting motion or otherwise?

A. I will state that I made a calculation of the strength of a half-inch-diameter shaft with two-inch crank arm and a half-inch-diameter crank pin two feet long acting on the same length crank arm, assuming the crank arm——

Q. Wait a moment. What demensions are those that you experimented with here?

A. The rod experimented with, as already spoken of, is approximately very close to a half-inch diameter, and it was for that reason
that I made this calculation. I took a shorter length of crank
225 pin than shown here for convenience of calculation; but it shows, however, all that it is necessary to show—the actual relative values in mechanics of the two devices. This crank pin two feet long, fastened rigidly to the two crank arms at one end, as shown in "Exhibit I," assuming the other end free to move and a weight applied to this free end until it arrived at its breaking strain, I found, say, could be expressed by 1. Reversing the conditions and holding one end of this same two-foot shaft rigidly and hanging a weight from the two-inch crank arm until the shaft twisted off by torsional strain, that weight, as compared with the other, is 24. In other words, a round beam two feet long from the edge of supports and a half inch in diameter, rigidly supported at one end and free to move at the other, will hold at the point two feet one pound; while the shaft of same size, half inch in diameter, with two-inch crank arm, will hold twenty-four pounds.

Q. Looking at "Defendant's Exhibit A" and "Defendant's Exhibit B" and having in view the results of the experiments you have made, are you able to state approximately, if not exactly, the rod in

which exhibit would be required to be the larger to perform the function of equalizing springs?

Objected to as immaterial and incompetent.

A. As shown in "Exhibit B," the rod in "B" would necessarily have to be larger than in "A."

Q. And how much larger, would you say, having in view the results of your experiments?

A. I could not tell by guess reasonably near enough to make a statement, but I could give the principles why it should be larger.

226 The amount would depend on, first, how large the first rod was in proportion to its length, and, second, on how rigid the whole mechanism was constructed, how long the arms, and how stiff the springs in proportion to the rod, for reasons that I could easily explain.

Q. Go on.

A. In the matter of transmission of motion the rigidity or stiffness of the rod comes in. I mean by transmission of motion, not the final motion, but the instantaneous motion applied and communicated. In other words, having the motion started at one end of the shaft, the object is to start at the same time at the other end. In assuming those conditions there are a number of elements that would determine the relative sizes of those bars, the main one being the starting stiffness of the springs themselves and the freedom of the crank and the shackle to take up strains from zero to maximum rather than from a fixed strain to overcome in the start; but started with the strain at zero at each end of same on the crank pins, then the motion at each end would be instantaneous, regardless of the length of the shaft, because whatever was applied at one end must necessarily be reacted on at the other before that strain can be produced; but if the one end to which the motion is to be communicated starts, say, with a fixed large resistance that has to be overcome by strain at the power end, then before the resistance can be overcome the rod must be thrown into a strain of torsion to such an extent as will balance this strain and resistance to be overcome. From that point on it will communicate motion exactly relative to the laws that I have already stated.

Q. Assuming the two springs are about two feet distance in both devices, what would you say as to the relative size of the two rods to communicate the same amount of motion—which should

227 be larger to get the same amount of motion if the same amount of motion can be communicated by both devices?

A. That is a difficult question to answer, for the reason of the stiffness of the springs, to start with.

Q. Assuming that the springs are equally stiff?

A. Well, that again would not determine it, because the springs may be so stiff that no motion would be communicated at all. This spring (Exhibit A) may be so stiff that while we move this and this spring moves by reason of this weight, yet this would communicate no motion whatever, as the drop of the spring here would not make sufficient elongation to produce enough torsion in the

rod itself or enough bending in the beam in this case to start the spring on the opposite side to which the power is applied.

Q. Assuming that in "Exhibit A" you do get a successful equalizing motion, and assuming that the distance apart between the two springs is the same, which method would require the larger rod—by "Exhibit A" or "Exhibit B"?

A. "Exhibit B," decidedly.

Q. To what element in that combination in "Exhibit B" is that due?

A. It is due to the difference in the device of the crank pin and the shaft. I would like to make another statement there It is also due to the initial strain to be communicated before motion in the second strain can be had by reason of the position and direction in which the springs act on the shackle and crank pin.

Q. Suppose that, instead of the device used in "Exhibit B" you take the rod, as shown in "Exhibit A," and bend it, deflect it, what effect would that have upon the transmission of motion?

A. It would be weaker than formerly—than as a shaft—
228 on the principle stated and shown.

Q. Have you experimented with any bent shaft?

A. I have.

Q. And with what result?

A. With the same proportionate result.

Q. Have you made any experiment with the bent shaft as shown in "Exhibit L"?

A. Yes, sir; but I could not obtain as accurate results from that as I could from the other. I wish to state that while I could not under the conditions given make as good and as satisfactory a test as in the former, yet my results carried out my principles the same.

Q. What do you mean by the same?

A. That any deflection from the center weakens the shaft.

Q. As you carry that deflection farther away from the center of motion——

A. (interrupting). The worse it is.

Q. State whether any of the conditions of the strain in the straight shaft are altered or changed by deflecting it away from its center of motion.

A. The conditions of strain are changed the instant that the shaft is bent out of its straight line or center of motion, and the farther the more the change will be.

Q. What change in principle is involved by bending the shaft?

A. It transfers the shaft into a crank pin and double crank arm connecting, and the principle of resisting of strains is different. In the shaft, it is by torsion; in the crank pin, it is by bending and twisting on the ends of the shackles or crank arms. The
229 strain as a beam is greater as the bend is farther away from the center of motion, and less as it approaches the center of motion, and the strain or torsion is reduced as it recedes from the center of motion, and increased to the maximum at the center of motion when it becomes a shaft.

Q. Take "Exhibit L" and assume that it is bent two inches at

this bend (indicating) and two inches in here (indicating), — state whether it is or is not stronger than if it were straight.

A. It certainly is not as strong as if it were straight.

Q. Would the bending strain in "Exhibit L" under those conditions be counteracted by the increased rigidity at this bend so as to be wholly overcome?

A. That simply shortens the distance of the beam; that is all; the beam being from one bend to the other and the torsion being in the end part as the crank.

Q. What element is there in "Exhibit L" that you do not find in "Exhibit I"?

A. May I ask you what you mean by "element"?

Q. What mechanical difference is there between "Exhibit I" and "Exhibit L"?

A. One is a shaft and the other is a double crank arm and crank pin.

Q. In communicating power by means of a shaft and by means of a crank pin, does the distance have the same effect in both?

Objected to.

A. It does not.

Q. Let me ask you whether what you call the crank arms on "Exhibit I" are known in mechanics as shackles?

A. They certainly are not. A shackle is a link or bar
230 loosely hinged at one end, with a bolt through eyes at the other; or, in other words, a shackle proper—where the term came from—is a link of a chain, and it is known now generally as a U-shaped piece, with eyes at the ends of the U for putting in a bolt and coupling parts of the chain together.

Q. State whether a crank arm is, in mechanics, loosely attached to the shaft or device which it is intended to turn.

A. It is always rigid as long as it remains a crank. As soon as it gets loose, it is a hanging link.

Cross-examination by Judge HALE:

Q. You did not give us the result of the experiments you made with "Exhibit I"?

A. I can give you the result, if that is what you wish.

Q. I say you have not done it.

A. I have, mechanically, given you the result. I have not given you the amount of the result.

Q. You did not give the amount of the difference as shown by the model in making your experiment?

A. I did not, because I was not asked.

Q. Do I understand you to say you made an experiment with "Exhibit L"?

A. I did.

Q. Did you compare the experiment made with "Exhibit L" with that made with "Exhibit I"?

A. I did not compare them thoroughly. I hadn't time.

Q. Can you make an experiment with the two exhibits now so as

to show exactly the difference between the two in the torsional strain?

A. You cannot on the model, exactly, as it is there.

Q. Can you approximately?

231 A. I think I can.

Q. Will you test the two, "Exhibit I" and "Exhibit L," in the manner in which you say you tested "Exhibit I" and give the result of the test?

A. (After making test.) The result of the test is this: That on one side of the guage-stick the deflection shown in "Exhibit I" is, with the bar alone, seven inches, and with the weight nine and one-half inches, while by "Exhibit L" the deflection due to the bar alone is seven and five-eighth- inches and with the weight ten and one-eighth inches. The difference shown, due to the small weight at the end of the lever, is exactly the same, two and one-half inches.

Q. That is, adding the weight you have the same result in each?

A. The deflection due to the additional weight is the same in each.

Q. In getting at the starting point in each case you could not do that exactly accurate, could you?

A. I could not, absolutely.

Q. When it dropped with the weight of the bar in each case it would fix more accurately a point in each case, would it not?

A. It would, after everything had come to a bearing.

Q. In the examination that you made, the showing that you got from adding the weight in each case is the more accurate test of the two tests, is it not?

A. Yes, sir; I think it is. It is for that reason that I put the weight on.

Q. You found it to be exactly the same in each case, did you not?

A. I found the measured distance to be exactly the same, as near as practicable, in each case.

Q. I mean the deflection caused by the addition of the weight was exactly the same in each case.

232 A. The measured deflection caused by the addition of the weight, as it was added, was the same.

Q. Then the size of the rods that you used were the same, were they not?

A. Practically the same.

Q. The one was bent and the other straight?

A. Yes, sir.

Q. Would "Exhibit L" be as strong as if another fork came out to the end of the shackle or crank arm?

A. I think not.

Q. Then that would be strengthened by adding an arm from the crook in the shaft to the crank arm, would it not?

A. It adds so much material, and therefore makes it stronger. It doubles the material at that point and makes a stronger base for the straight part to act on.

Q. Then "Exhibit K," with the same weight of material, would be stronger than "Exhibit L," would it not?

A. It would, I think.

Q. That is your judgment about it?

A. That is my judgment. I will explain why there is some doubt—this not being connected across here at the fork or iron.

Q. You find practically, then, in Exhibits L and I no difference shown by the test in the torsional strain of the two?

A. I do find a difference in the two by the test made.

Q. What is the ratio of that difference?

A. I have not had time to figure that out, but I can easily show that the conditions of the weight were not the same.

Q. Taking the whole of the difference with the weight added, and would not the ratio be as 81 to 76?

A. I have not made the calculation. You have not allowed me to complete the experiment—that is, to get at the result of

233 these figures that I have obtained by the experiment.

Q. Have you not practically applied to each of these Exhibits I and L a weight similar to that that would be applied in the construction of a buggy?

A. It might be in each individual case, but yet they are not the *the* same in these two comparisons, one with the other.

Q. I did not ask you about that; but the strains that you put upon each, taking it separately, are similar to the strains that would be applied in the case of a buggy?

A. The strains are similar, as near as can be, from this model.

Q. Is not the test that you have made of these two a comparatively accurate test of the torsional strain?

A. If the proper conclusion is arrived at from the figures shown. What do you mean by the "test?"

Q. Just what you are a mind to have it mean.

A. The test is not complete so far.

Q. What would you have to do to complete it?

A. I would have to figure to reduce the weight to the same condition. In the one the weight was heavier than in the other by reason of the more flat angle of the bar that it was added to, and as the two bars are of the same size and we used a very small weight, the small limits you have to work in have got to be taken into account very closely; and, as the angle of this bar lowers the weight increases, the center of gravity having a longer leverage on it, and therefore, to have a fair comparison, they must be reduced to the same applied weight.

Q. Is it not possible to put these two Exhibits L and I into the same position upon this frame and show the comparative strength of the two?

A. It is possible.

234 Q. Why did you not do it?

A. I have not got the things here to do it with.

Q. When you were making the experiment you were doing it for the purpose of showing by this model how the two compare, were you not?

A. But the result of all experiments must be read intelligently,

and, while this is all right to get at your figures, with the same reasoning you have got to get at the conditions under which each act.

Q. Tell me what figures you would make to reduce your experiment to the true test.

A. I would reduce the center of gravity of that bar M to the same position in both cases; also the weight that was additionally applied.

Q. Did I not ask you to make the test of the two, so as to get the exact result?

A. I have made the exact test, but you have not allowed me to complete it.

Q. I will allow you to do anything that you want to to complete it.

A. I will have to weight the bar and reduce it to the same condition, as the weight changes with the angle.

Q. You have testified in your direct examination of a test made with "Exhibit I" placed as in the test just made and reversed, have you not?

A. Yes, sir.

Q. Did you in that instance weight the bar?

A. No, sir.

Q. Did you make any calculations as to the different con-
235 ditions in the two?

A. Yes, sir.

Q. Did you do anything more in making that test than you have in making the one here before us now?

A. In making the test, I did not.

Q. You knew no more about the weight of the bar than you know now?

A. No, sir.

Q. And still you based your testimony, did you not, to some extent upon the result of the experiment that you have made?

A. I certainly did.

Q. You did that because you found a difference shown in the indicators as this bar went down?

A. I did that for I knew where the bar started from and I knew at that angle, whatever the weight of the bar may be, that it was different from the weight at any other angle; and, having these two results exactly the same and the one having a larger weight applied to it than the other, by reason of its angle, I made my calculation that the one weight—the larger weight—was the stronger, and therefore it was a straight rod, without going into any furtker figures than that.

Q. You have made no experiment with "Exhibit K"?

A. Not now.

Q. Have you at any time?

A. I did.

Q. When?

A. To-day.

Q. What did you find the result to be with "Exhibit K" as compared with "Exhibit I"?

236 A. I did not carry it to a result for the reason that the two were not of the same size and they were not of the same conditions, and I had not time to reduce them by figures to the same size or to reduce those angles that I speak of to the same. I only had time to make an accurate test of the first, "Exhibit I," and a comparative test, as I explained to you, of "Exhibit L."

Q. Then, in making your experiments for the purpose of giving your testimony, instead of comparing accurately Exhibits I and L or Exhibits I and K you experimented with Exhibit I alone. Is not that true?

A. I did not experiment for comparative tests of the two; that was not the object of my experimenting.

Q. Are you able to state from any tests you have made the comparative strength of Exhibits I, L, and K?

A. Not in an absolute degree, but I can in the degree of more or less.

Q. That is, you can from theory and not from experiment?

A. I can from experiment. I mean in the degree that one is stiffer or less stiff than the other, as it may be.

Q. Is not Exhibit K stiffer than either of the others, Exhibits I or L?

A. It certainly is.

Q. And it would stand a greater strain, do you mean?

A. That I do not know without breaking it; that is a different thing. You cannot compare the stiffness of these and their breaking strain in the same way. They follow entirely different laws.

Q. Is it not your judgment that it would stand a greater strain?

237 A. No, sir; this (Exhibit K) would break first; that is my judgment.

Q. But you are not entirely sure of it?

A. I am not positive of it because I have not tried it.

Q. Now, as to the comparative strength of Exhibit L and Exhibit I?

A. Exhibit I is the stronger.

Q. Which does your experiment show to possess the greatest resistance to torsional strain?

A. The stiffest you mean.

Q. Which does your experiment show to be the stiffest?

A. I.

Q. And to any considerable degree?

A. The experiment does not show that.

Q. You said something in your direct examination about the comparative torsional strain in Exhibit I placed in that position now upon the frame and turned with the crank arms fastened and reversed, did you not?

A. I did.

Q. The ratio between the two, did I understand you to say, was as 1 to 24?

A. I did not.

Q. What would be the ratio?

A. I cannot tell without figuring.

Q. You have not figured that?

A. I have not figured the exact ratio between the two.

Q. What did you mean by 1 to 24?

A. I meant simply this: to show the principle of the two—that is, if this was solely as a beam supported at the fixed end and free to move at the other end that the rod would hold one
238 pound only in weight at two feet from this fixed end, whereas the same rod would hold on the two-inch lever arm twenty-four pounds. I will state that I made no absolute test of the exact strength of any of these because it is more than could be done in so short a time without an actual testing machine.

Q. Then, as I understand you, you are not prepared to say what is the comparative strength or comparative stiffness of either of these exhibits?

A. Not the comparative strength. I am not; no. I can get at the comparative stiffness approximately from them.

Q. Take Exhibit I compared with Exhibit K. What is the comparative stiffness of the two?

A. I have not made experiments enough with that to determine it.

Q. Take Exhibits I and L. What is the comparative stiffness of the two?

A. That I would have to figure from what I have already got.

Q. From the experiment you just made here this afternoon?

A. Yes, sir; the experiment just made before you.

Q. It would not be very much, would it?

A. There is not a great deal of difference by reason of the small deflection to which it is bent, but still there would be a difference. All that I wish to say is that there is a difference, no matter how small, between the two.

Q. You did not testify, then, in your former examination that the comparative stiffness of the two was as one to six or more?

A. No, sir; I did not. It was put in exactly the same sense as I have explained it to you now, and, as I had nothing to go by, it was a mere guess at that—that is, a mere judgment, guess.
239 Q. What were your figures, as you gave them here as representing 1 to 24, intended to show?

A. They were simply intended to show the principle, which is absolute and without doubt the fact—the principle that as soon as a shaft is bent out of its true line, then it is weakened in a degree, no matter how small it may be, and the farther it is bent from that axis line the greater that degree will be.

Q. By bending this shaft, "Exhibit L," to the form shown and connecting with the other end of the crank arm by another arm on the principle shown in model, Exhibit B, you do not weaken the stiffness of the shaft, do you?

A. You do in model, Exhibit B, taking it as it is.

Q. Exhibits I and L are of the same size?

A. Yes, sir.

Q. L is crooked and I is straight—a shaft?

A. Yes, sir.

Q. If you add to L a connection from the crook to the other end of the crank beam, then which of the two, in your judgment, would be the stiffer—I or L?

A. I think that L would be the stiffer.

Q. Why?

A. There is more material at it, and the lever arm is only one-half what it is in I, and the resultant of the material, which is more, would produce a little greater stiffness; but I do not think that it would be of greater strength.

Q. Would not they be of equal strength?

A. Not necessarily.

Q. What is your judgment about it? Would they be of

240 about equal strength?

A. They would be, very nearly; yes, sir.

Q. Then a buggy constructed with a connecting rod, as shown by Exhibit I, and a connecting rod, as shown in Exhibit L, with the addition of a connection to the other end of the crank arm, would make the latter in stiffness and strength equal to the former, would it not?

A. I think it would.

Q. In such case, then, you would not destroy either the strength or stiffness of the rod by crooking, would you?

A. You would.

Q. If, after the crooking, the one is left stronger and stiffer than the other or are of equal strength and stiffness, have you destroyed the strength by the crooking?

A. It was not the crooking that added the strength, but it was adding the extra material that added the strength—adding another member; making a different rod of it, and not the same rod.

Q. Your experiment that you made here before us shows the deflection of the two to be about the same by using the same weight and bar. That is true, is it not?

A. Not with the same weight.

Q. Did you not use the same weight in making that experiment in the two cases?

A. They did not act under the same conditions, therefore the weights as actually applied here were not the same.

Q. About the same?

A. There was not much difference. There is necessarily not much difference, as the figures would show. There would not be much difference, as the deflection is small.

241 Q. By adding the connection between the crook and the other end of the crank arm you more than overcome what you have lost by the crook, do you not?

A. In this particular case?

Q. Yes, sir.

A. I think it would.

Q. Supposing the crank arms were lengthened from two to two and a half inches and the rod crooked to the center and attached as I have supposed?

A. That would be worse.
Q. Would it not still be as stiff as the str-ight rod?
A. I think not.
Q. Nearly so?
A. The difference is so small that the difference of stiffness cannot be very much, as the variations of the conditions of the two are not great.

Redirect examination:

Q. These three rods, I, K, and L, when applied for the purpose of communicating motion, varied, I understand you to say, one from the other in power to do that?

Objected to as not proper re-examination and as leading.

A. I said that; but, as I said, as applied in Exhibit A and B they certainly do.
Q. State, if you can, approximately, either from experiments that you have made or from your own knowledge of the matter, in what proportion these three rods would vary in their power to transmit motion.

Objected to as not proper re-examination.

A. Do you mean these rods just as they are?
242 Q. These three rods in the form or shape they are as applied to a buggy.
A. If they are applied in the same way and in the same position they would be very nearly the same.
Q. Which would be the stronger?
A. Exhibit K would be the stiffer, but I am not positive as to the strength. It is a larger rod.
Q. How is that motion communicated from one spring to another in Exhibit K differently from the motion communicated by the use of Exhibit I?

Objected to.

A. In Exhibit I it is communicated solely by torsion. In Exhibit K it is communicated largely by bending and partially by torsion.
Q. Assuming that rod K is constructed of the same weight and size as rod Exhibit I, what would be the difference then? Why is rod K stiffer than rod I?
A. The first reason is, the part through which the torsion acts is shorter on the straight part than it is in Exhibit I; again, the part of the beam action is taken up by two rods, instead of one, and hence it makes a shorter end of fulcrum of it, and the difference of eccectricity of the straight part of the rod in relation to the center—this split part—is only one-half that of Exhibit I.
Q. How does Exhibit K differ in construction and operation from the rod shown in Exhibit B?
A. Exhibit K is not shown in Exhibit B.

Q. Well, applied to a buggy for the purpose of equalizing the springs?

243 A. It depends on which way it is applied—whether it is Exhibit K or Exhibit A.

Q. Can you apply Exhibit K as the rod is shown in Defendant's Exhibit A?

A. No; not exactly in the same way as it is here. I presume it can be done by a modification of this, but that is not the objection that I made to answering the question direct. It is this, that the rod applied in this form, with this shackle nearly vertical, will have to be stronger to communicate the motion than it will in this form with the crank arm. It is simply the difference in the way it is hung.

Q. In operation, assuming that Exhibit K is hung as the rod shown in Exhibit B, what difference is there in the principle of communicating motion in the two rods then?

Objected to.

A. Exhibit K communicates motion as a crank pin between two cranks.

Q. How is it when Exhibit K is hung as shown in Exhibit A?

Objected to.

A. That motion communicated is the same.

Q. The same motion?

A. The same motion.

Q. What is that—what do you call it?

A. It is bending and torsion combined, or the action of a crank pin. The position of the crank or the shackle has nothing to do with the manner or the strains by which the motion is communicated, but the degree to which the motion may be communicated in the one or the other is very different by the position of the shaft.

Q. Applying Exhibit K as shown in Exhibit B or Exhibit

244 A, where, if at all, in Exhibit K is there a shackle?

A. There is no shackle in Exhibit K.

Q. Then what would you say as to the difference between Exhibit K and the rod shown in Exhibit B, with respect to that point—shackle?

A. One is connected to a shackle and the other is connected rigidly to two pins and a crank arm, the pins being the shaft of the crank arm, one the center and the other the crank pin.

Q. Would the two rods—one Exhibit K and the other Exhibit B—if hung in the same way perform their functions in the same way, one having a crank bar rigidly attached and the other having a shackle?

Objected to.

A. They would perform their office through the same principles, but the degree of efficiency to which they would perform it would

depend on the size of the con ecting pins and the rigidity with which they were put in.

Q. Supposing Exhibit K was hung in substantially the same way as the rod in Exhibit B, how far from the center of motion would the rod in Exhibit K be?

A. The connecting bar would be about two and one-third inches. That would be in the ratio of seven to two or as three and one-half to one.

Q. Then in order to make the rod as shown in Exhibit A equal to the rod Exhibit K the center of motion would have to be raised t-o and one-third inches?

A. About two and one-third.

Q. In making your proportions, as testified to awhile ago, in Exhibit I, where the ratio is 1 to 24, how would that ratio affect the
245 operation of the equalization of springs as shown in the Complainants' Exhibit A? In other words, what has it to do with it?

A. That was simply to illustrate and to show the relative values of a torsional shaft and a bending beam, and, as in one case a part of the iron that was used in one of the exhibits with a bent shaft acted as a bending beam and as the other acted entirely in tortion, that the maximum value of the iron was gotten out by keeping it in torsion. For that reason these ratios vary. It was simply to show the principle by which they did vary; not the actual amount. To make that strong showing with a contorted case or a contorted use of the material would make a very apparent difference, and all the grades of difference, of course, back to the least would be shown just in proportion.

Q. Then, as I understand it, these figures do not show the relation or the ratio between the communicated power of the devices?

A. Not as they are constructed.

Q. What would that ratio be, approximately?

Objected to.

A. Exhibit B would be decidedly the weaker in the way it is applied. Assuming that these other exhibits are applied in the same way—the same position with a shackle—their efficiency would not be very materially different.

Q. You mean hung in the same way to communicate power from one side of a buggy to the other?

A. If they are hung to get the best value out of each.

Q. What would you say was the ratio of difference in the power of the two where you hung Exhibit L as shown in Exhibit B, and Exhibit I as shown in Exhibit A?

246 A. There would be a very great difference.

Q. Suppose you hang the rod as shown in Exhibit B in the same relative position as is shown in Exhibit A, what would be the approximate ratio of difference between the two?

A. Exhibit A, as shown, would be the stronger.

Q. Why?

A. Because the lever arm through which the power acts here (indicating) is shorter than it is in there (indicating) by the same scale.

Q. Supposing that in Exhibit A the crank arms were just as long as they are shown to be in Exhibit B and they are hung in the same relative position, Exhibit B having a shackle here (indicating) and Exhibit A having crank arms here (indicating), what would be the ratio of difference in their power to communicate motion to make the equalization of the springs?

A. The shaft would communicate the most in that case.

Q. How would it communicate it—in the same way or in a different way?

A. An entirely different way.

Recross-examination:

Q. If you hang the rod in Exhibit B in exactly the same position as shown in Exhibit A, and the shackle being of the same length as the crank arms, then would you not get the same efficiency from the device as shown by Exhibit B as you would from Exhibit A?

A. You would, provided those were made heavy, strong enough.

Q. It would not have to be made any stronger than the other, would it?

A. Oh, yes; there is more material at it. There is this
247 extra piece added.

Q. With the same length of shackle in Exhibits A and B and hung in precisely the same shape, with the same stiffness of spring, would not the one be just as efficient as the other?

A. Very nearly.

Q. Then by taking the model Exhibit B and shortening the shackle to the dimensions shown by Exhibit A and hanging it in the same position as Exhibit A you would get substantially the same result, would you not?

A. Certainly.

Q. And there would be comparatively no difference in the efficiency of the two, would there, those conditions being taken?

A. There would not be a great deal with the things as assumed.

(By Mr. SHERMAN:)

Q. But one would be operated by means of a crank beam and the other by means of a shaft?

A. They produce the result through different mechanical devices, and not in the same way.

ALEXANDER H. BROWN.

248 OFFICE OF SHERMAN AND HOYT,
CLEVELAND, OHIO, *February* 25—9.30 a. m.

ALEXANDER E. BROWN, recalled by H. S. SHERMAN, Esq., counsel for complainant, testified as follows:

Q. You were inquired of by Judge Hale as to the results of the experiments you made on the testing model "H," and you stated you could not give the full or complete results, day before yesterday.

If you have completed the experiments so as to give the full results you may do so and state what they are as to these rods.

Objected to on the ground that the taking of the deposition was closed on the 23rd inst.

A. The result of all the tests—which were six in number—that I made of these exhibits in the various ways and the Exhibits "I," "L," and "K," four experiments, to get at data from which to arrive at definite results were made in the morning as carefully as could be from the model, and two at the request of Judge Hale were made in the afternoon in his presence, but I could not state what the final result of those data was until now. I have a diagram showing exactly, as near as it was possible to get from these experimental data, the results of these tests sought for, which I mark "Complainants' Exhibit X." In this exhibit I have shown by diagram the different exhibit rods—Exhibit "I," "L," and "K"—and have marked on them the positions at which I used the center of oscillation in making the test. Above these, as shown, the lines marked "A. M." and "P. M." indicate the result of the experiments made in the morning and afternoon. These lines indicate proportionately the deflections of these different exhibits due to equal weights applied under all similar circumstances, as related to the conditions of the experiments, as shown. On the diagram, Exhibit I, marked position I′, is Exhibit I reversed, the center of oscillation being through the ends of the crank arms instead of through the rod connecting them, as shown by red line on diagram. The result of these experiments carries out more clearly the principles I have already explained as applied in these cases than I had expected from the first judgment by eye of the actual experiment. The result shows, first, the shaft with two-inch crank arm. Exhibit "I" is the stiffest and strongest of any of the three exhibits. Exhibit "L" is the next in order of stiffness. Exhibit "I," position I′, is the next. Exhibit "K" is the weakest of all. This is my final, positive judgment, founded on the proper results of these experiments rather than on a partially completed test, and whatever has appeared to the contra-y before in my testimony, if anything, I wish distinctly understood to be corrected by these final results.

249

Q. Now, from the results thus shown of these experiments made by you, what is your judgment as to its being necessary to increase the size of the rods "K" and "L" to get the result shown in "I"?

A. As applied how?

Q. As applied for equalizing the springs or communicating motion.

A. In what way? There are a thousand ways to apply it.

Q. As shown in the Defendant's Exhibits A and B, if you know what I mean.

A. My former judgment was it required six times, if I remember, the amount of material in Exhibit B, and my judgment now confirms fully my former judgment that Exhibit B would require six times the amount of material as Exhibit A, at least.

250

Cross-examination by Judge HALE:

Q. You have made no further tests with the testing machine or testing model since you gave your testimony the other day, have you?

A. I have not. I have only completed those tests.

Q. In completing those tests what have you done?

A. I have taken the figures that the model gave me as data and arrived at the result that is asked for, and in doing so I had to plot the whole experiment out as it actually was to reduce them to equal conditions. As the model was constructed these conditions, as applied to the different ones, were not the same for a visual, actual, apparent comparison on the model itself.

Q. In giving your estimate of the increased size required by Exhibit B you take into consideration the mode in which it is hung, do you not?

A. I certainly must, as I take into consideration the two exhibits shown me.

Q. Now, supposing Exhibit B was hung as to length of shackle and as to position the same as in Exhibit A, what would be the result?

A. Exhibit B applied as in Exhibit A would certainly be weaker than Exhibit A, as shown.

Q. You don't mean to the extent of six to one, do you?

A. That I could not tell.

Q. Give your judgment.

A. Very nearly; it would be from three to six to one.

251 Q. Do you say the efficiency of the rod in the position now shown by Defendant's Exhibit M as compared with the Defendant's Exhibit A would sustain the same relation as you have indicated?

A. The efficiency would be a little better; not a great deal.

Q. Supposing the shackle in Exhibit B is made of the same length as the crank arms in Exhibit A and the two hung with the same weight of spring and in the same position as Exhibit A, then would the two vary much in the efficiency to transmit the motion from one spring to the other?

A. The rod in Exhibit A as in the position and conditions explained by you would be weaker than the same rod used as the shaft shown in Exhibit A.

Q. With the conditions named the connecting rod, as shown in Exhibit B, would be equally strong with the shaft on Exhibit A, would it not?

A. It would not.

Q. The only difference in the two is that the device as shown in Exhibit A would be more efficient in producing the required results?

A. Certainly; and the principles through which they act would be different, if you mean that.

ALEXANDER H. BROWN.

(Here follows diagram marked p. 252.)

253 STATE OF OHIO, }
Cuyahoga County, } *ss:*

I, A. C. Dustin, a notary public in and for said State and county, duly commissioned and qualified, do hereby certify that the above-named Alexander H. Brown was by me first sworn to testify the truth, the whole truth, and nothing but the truth, and that, by agreement of counsel, objection to the manner and time of taking this deposition was waived, and the testimony of the said Brown was taken by A. Hippard on the 23rd of Feb. in short-hand, and on the 25th the said Brown was recalled for the purpose of giving results of experiments he had made, and his testimony on said last-named day was taken by J. G. Pomerene in short-hand (the said Hippard and Pomerene being proper persons and not interested in the event of this action), and by them reduced to writing on the typewriter, and, by agreement of counsel and authority of the witness, I hereto affixed the name of the witness after the same was written out as aforesaid, and that the exhibit hereto attached was offered in evidence and by me, marked "Complainants' Exhibit X," and attached to this deposition.

I further certify that I am not a relative or attorney of either party to this action nor otherwise interested in the same.

In witness whereof I hereunto set my hand and official seal this 25th day of February, 1885.

[SEAL.]

A. C. DUSTIN,
Notary Public.

Total cost of taking deposition, $21.00, paid by complainants.

A. C. DUSTIN,
Notary Public.

Indorsed: "Filed Feb. 26, 1885."

254 And afterwards, to wit, on the 22nd day of April, A. D. 1885, the following decree was entered in said cause, viz:

JOHN A. TOPLIFF *et al.* }
vs. } Chancery. No. 4289.
ISAAC N. TOPLIFF. }

This day came the parties, by their solicitors, and thereupon this cause came on to be heard upon the bill, answer, replication, and the testimony and exhibits filed herein, and was argued by counsel; whereupon the court, being fully advised in the premises, do find that the equity of the case is with the complainants.

And the court further find that the letters patent set forth in complainants' bill, to wit, the letters patent issued to John B. Augur, dated Oct. 11th, 1870, and numbered 108,085, and the reissued letters patent issued to complainants, dated March 28th, 1876, numbered 7017, are good and valid letters patent and reissued letters patent, and are hereby sustained, and that said letters patent and reissued letters patent respectively and all the rights thereby

secured were at the date of the filing of the complainants' bill herein and now are the exclusive property of said complainants.

And the court do further find that prior to the filing of said complainants' bill said defendant, Isaac N. Topliff, without the license of the said complainants and in violation of their rights under said letters patent and reissued letters patent, has made, used, and sold to others to be used the inventions and improvements de-
255 scribed and claimed in said letters patent and reissued letters patent respectively, and has thereby infringed the rights secured to said complainants in and by said letters patent and reissued letters patent.

It is therefore ordered, adjudged, and decreed that this cause be referred to A. J. Ricks, Esq., a master of this court, who is hereby directed to take an account of all the gains and profits which have accrued to the said defendant, Isaac N. Topliff, from the manufacture, use, and sale of the inventions and improvements or any part of them described in said letters patent and reissued letters patent respectively, and also to take an account of all the damages suffered by the complainants by reason of such unlawful acts of the said defendant and his infringement of said letters patent and reissued letters patent respectively; and said master shall report his findings to this court as soon as may be; and for the better taking of such accounts the said defendant shall produce under oath before said master all books, papers, and accounts relating to his said manufacture, use, and sale of said inventions and improvements.

And it is further ordered, adjudged, and decreed that the said defendant, Isaac N. Topliff, his agents, attorneys, workmen, and servants, each and all of them, be, and the same are hereby, perpetually enjoined and restrained from directly or indirectly making, constructing, using, vending, delivering or working, continuing or putting into practice, operation, or use, or in any way counterfeiting or imitating the said inventions and improvements or any part thereof.

256 And afterwards, on the 22nd day of April, 1885, the following writ of injunction was issued, viz:

THE UNITED STATES OF AMERICA, } *set:*
Northern District of Ohio, Eastern Division. }

The President of the United States to Isaac N. Topliff, — agents, servants, employés, and workmen, and all others acting by and under his authority, and each of them, Greeting:

Whereas John A. Topliff and George H. Ely lately exhibited their bill of complaint against the said Isaac N. Topliff, as defendants, in the circuit court of the United States in and for the northern district of Ohio, before the judges of the said court, in which said bill it is, among other things, alleged that certain letters patent No. 108,085 were granted on the 11th day of October, 1870, to John B. Augur (and letters patent No. 123,937, granted on Feb'y

20th, 1872, issued to Cyrus W. Salladee) and reissued letters patent No. 7017, dated M'ch 28th, 1876, issued to complainants; that the said defendant, Isaac N. Topliff, has constructed and used and vended to others to be used the said patented improvements, in some parts thereof substantially the same in construction and operation as in the said letters patent mentioned, in violation of the exclusive rights of the said complainant as secured by the letters patent aforesaid;

257 And whereas, on a final hearing of the matters alleged in the said bill and after due consideration, it was ordered that the said defendant might be enjoined from any further construction, use, or sale in any manner of the said patented improvements or any or either of them:

Now, therefore, in consideration of the premises, you, the said Isaac N. Topliff, your agents, servants, employés and workmen, and all others acting by and under your authority, and each and every of you, are strictly commanded and enjoined, under the penalty of ten thousand dollars, that you and each of you do absolutely desist and abstain from any and all further construction, use, or sale in any manner of said patented improvements, jointly or severally, or of any of them, and from doing any act or thing to infringe the said letters patent or any of them or to injure or impair the exclusive right of the complainant to the inventions and improvements or any of them in such letters patent specified and described.

Witness the Honorable Morrison R. Waite, Chief Justice of the Supreme Court of the United States, at the court-house, in the city of Cleveland, in the northern district of Ohio, this 22nd day of April, anno Domini one thousand eight hundred and eighty-five, and of our Independence the 109th year.

[SEAL.] A. J. RICKS, *Clerk*,
By O. C. BEATTY,
Deputy Clerk.

(Endorsed:) Writ of injunction. This writ issued and then withheld by order of compl'ts' att'y. A. J. Ricks, clerk.

258 And afterwards, on May 2nd, 1885, the following motion was filed, viz:

UNITED STATES OF AMERICA, *ss:*

In the Circuit Court of the Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF. } Motion to Modify Decree.

Now comes the respondent, Isaac N. Topliff, and moves the court that the decree entered in said cause be modified so that said respondent may be allowed to continue the manufacture and sale of articles

under said letters patent to the extent of filling the *bona fide* orders for the same received up to the rendering of said decree.

ISAAC N. TOPLIFF.
By BOYNTON & HALE,
His Attorneys.

(Endorsed:) Motion to modify decree. Filed May 2, 1885. A. J. Ricks, clerk.

259 And afterwards, on Saturday, May 2nd, 1885, the following order was entered in said cause, viz:

This day this cause came on for hearing on motion of the respondent for a modification of the decree heretofore made in this case, and was argued by counsel, and the court, being fully advised in the premises, do grant said motion; and it is ordered and adjudged that said decree be, and the same is hereby, so modified as to the injunction therein granted as to allow said respondent to continue the manufacture and sale of connecting rods to the extent of filling all *bona fide* orders for the same received by him prior to the date of the rendition of said decree, provided that said defendant shall first give a bond in the sum of $2,000.00, with sureties to be approved by the clerk of this court, conditioned for the defendants paying to the complainants all profits and damages which would accrue to the complainants by reason of such manufacture and sale, and the injunction so modified may issue.

260 And afterwards, on May 2nd, 1885, the following writ of injunction was issued, viz:

THE UNITED STATES OF AMERICA, } *set:*
Northern District of Ohio, Eastern Division, }

The President of the United States to Isaac N. Topliff, his agents, servants, employés, and workman, and all others acting by and under his authority, and each of them, Greeting:

Whereas John A. Topliff and George H. Ely lately exhibited their bill of complaint against the said Isaac N. Topliff, as defendant, in the circuit court of the United States in and for the northern district of Ohio, before the judges of the said court, in which said bill it is, among other things, alleged that certain letters patent No. 108,055 were granted on the 11th day of October, 1870, to John B. Augur, and reissued letters patent No. 7017, dated March 28th, 1876, issued to complainants; that the said defendant, Isaac N. Topliff, has constructed and used and vended to others to be used the said patented improvements, in some parts thereof substantially the same in construction and operation as in the said letters patent mentioned, in violation of the exclusive rights of the said complainant as secured by the letters patent aforesaid;

And whereas, on a final hearing of the matters alleged in
261 the said bill and after due consideration, it was ordered that the said defendant might be enjoined from any further con-

struction, use, or sale in any manner of the said patented improvements or any or either of them:

Now, therefore, in consideration of the premises, you, the said Isaac N. Topliff, except to the extend of filling all *bona fide* orders for said articles received by you prior to April 22nd, 1885, your agents, servants, employés, and workmen, and all others acting by and under your authority, and each and every of you, are strictly commanded and enjoined, under the penalty of ten thousand dollars, that you and each of you do absolutely desist and abstain from any and all further construction, use, or sale in any manner of said patented improvements, jointly or severally, or of any of them, and from doing any act or thing to infringe the said letters patent or any of them, or to injure or impair the exclusive right of the complainant to the inventions and improvements or any of them in such letters patent specified and described.

Witness the Honorable Morrison R. Waite, Chief Justice of the Supreme Court of the United States, at the court-house, in the city of Cleveland, in the northern district of Ohio, this 2nd day of May, anno Domini one thousand eight hundred and eighty-five, and of our Independence the 109th year.

[SEAL.] AUGUSTUS J. RICKS, *Clerk.*

Endorsed: Writ of injunction. Returned and filed May 9th, 1885.

A. J. RICKS, *Clerk.*

NORTHERN DISTRICT OF OHIO, *ss:*

On the 4th day of May, 1885, at Cleveland, Ohio, I delivered to the within-named Isaac N. Topliff a true and duly certified copy of this writ.

W. F. GOODSPEED,
U. S. Marshal,
By JOHN ODELL, *Deputy.*

262 And afterwards, to wit, on the 2nd day of May, 1885, there was filed in this cause an affidavit, which is in the words and figures following, to wit:

UNITED STATES OF AMERICA:

In Circuit Court for N. D. of Ohio, E. D.

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF. } Equity. 4289. Affidavit.

Isaac N. Topliff, having been first duly sworn, deposes and says, upon oath, that up to the date of the rendering of the decree in said cause he had been receiving and filling orders for the articles that he was manufacturing under the said letters patent therein declared void, in good faith, and in the belief that he was in no way infringing on said other patents; that he has now on hand and unfilled

bona fide orders for such articles, and that it would work great injury to him if he were not allowed to fill such orders as he now has on hand.

I. N. TOPLIFF.

Sworn to by said Isaac N. Topliff before me and in my presence by him subscribed this 29th day of April, A. D. 1885.

[SEAL.] CHARLES W. BAKER,
Notary Public.

Endorsed: = 4289. U. S. circuit court. John A. Topliff *et al. vs.* Isaac N. Topliff. Affidavit of Isaac N. Topliff. Filed May 2, 1885. A. J. Ricks, clerk U. S. circuit court.

263 And afterwards, on May 2nd, 1885, the following bond was filed, viz:

Know all men by these presents that we, Isaac N. Topliff, as principal, and John C. Hale, as sureties, are held and firmly bound unto John A. Topliff and George H. Ely in the sum of two thousand dollars, to the payment whereof we bind ourselves, our heirs, executors, and administrators, firmly by these presents.

The condition of the above obligation is such that whereas by the terms of a decree of the United States circuit court for the northern district of Ohio rendered at the April term of said court the said Isaac N. Topliff was enjoined from manufacturing and selling a certain connecting rod for buggy springs, except that he was thereby allowed to continue the sale and manufacture of the same to the extent of filling all *bona fide* orders for the same that he had received up to the rendering of said decree; and whereas said Isaac N. Topliff has this day filed with the clerk of said court a sworn statement specifying as nearly as practicable the number and amount of such orders so received and unfilled: Now, if the said Isaac N. Topliff shall truly restrict himself in the further manufacture and sale of said connecting rods to the extent by said decree allowed, and shall only fill such orders as above specified, then these presents shall be null and void; otherwise to remain in full force.

ISAAC N. TOPLIFF. [SEAL.]
JOHN C HALE. [SEAL.]

Endorsed: 4289. John A. Topliff *et al. vs.* Isaac N. Topliff. Bond to comply with decree of court as to filling *bona fide* orders. Approved and filed May 2nd, 1885. A. J. Ricks, clerk.

264 And afterwards, on the 11th day of October, 1886, a special master's report was filed, which is in the words and figures following, to wit:

In the Circuit Court of the United States, Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF and GEORGE H. ELY
vs.
ISAAC N. TOPLIFF. } Equity. No. 4289.

To the honorable the judges of the circuit court for said district:

The undersigned was appointed a special master by an interlocutory decree entered at the April term, A. D. 1886, of your court to hear testimony and "to take an account of all the gains and profits which have accrued to the said defendant, Isaac N. Topliff, from the manufacture, use, and sale of the inventions and improvements or any part of them described in said letters patent and reissued letters patent respectively, and also to take an account of all the damages suffered by the complainants by reason of such unlawful acts of the said defendant and his infringement of said letters patent and reissued letters patent respectively, and said master shall report his findings to this court as soon as may be; and for the better taking of such accounts the said defendant shall produce under oath before said master all books, papers, and accounts relating to his said manufacture, use, and sale of said inventions and improvements."

265 I have heard such testimony as counsel for the parties have offered; have heard arguments upon the issues submitted, and, after due consideration, submit my findings as follows:

The complainants were the manufacturers of the equalizers described in the patents held to be valid in the decree, and under the privileges conferred by law were the exclusive manufacturers thereof. They equipped their establishment with sufficient machinery to enable them to supply the market with their invention, and they neither issued licenses nor established a royalty for the manufacture or use of their improvement.

They began the manufacture of the patented article about 1880, and it was at once accepted by the public as a useful and valuable improvement. Its sale was extensive and very profitable. It was in the line of their other manufactured productions and increased the value of their other business.

The defendant, engaged in a similar line of business, concluded that the manufacture of a similar article would enable him to better sell his other products, and accordingly early in 1882 he began making and selling the infringing article. He embarked in this enterprise *with* full knowledge of complainants' patents and of their facilities for the cheap, rapid, and profitable manufacture of the article therein described. He was familiar with complainants' mode of doing business and knew how to reach their customers. His infringement was not therefore accidental or in ignorance of complainants' claims. He must have calculated the risks and intelligently assumed the responsibilities attending his venture.

The testimony shows that defendants, though extensively
266 a manufacturer of the infringed article, made no profit in his business. The complainant cannot therefore recover any

sum on that ground. The only question therefore left to be determined is the amount of damages complainants have sustained because of defendant's infringement.

The defendant contends that the measure of damages for which he is liable is for the use of only that particular part of the equalizer in which he claims his improvement was held to be an infringement; but in my opinion that part affects the value of the improvement as a whole, and makes it the useful and valuable improvement it has been shown to be.

It is that feature or part of it which makes it saleable and valuable and adds to the value of the product as finished and put upon sale.

The testimony shows that complainants could have supplied all the demands of purchasers for the equalizers. Their producing capacity was far in excess of their sales. The purchasers from the defendants in many instances were former customers of the complainants. They knew the value of the equalizers, and if they had not been able to buy them from the defendant would have bought them from the complainants.

It is difficult to ascertain by exact calculation just what proportion of defendant's sales would have been made by complainants. It cannot be definitely proven, but certain facts established in this accounting enable me to approximate with reasonable certainty about the number of such equalizers the complainants would have sold. The books of both establishments show as complainants' sales di-

267 minished the defendant's increased. They held the same territory tributary to their business; the same customers appear upon each other's books. The article manufactured was wanted by the purchasers and could only be procured from the complainants or defendants. Most of those who purchased from the defendant would have purchased from the complainants if the defendant could not have supplied them. Some who purchased from the defendants, if he had not been able to supply them, would have accepted some other substitute of similar kind. How many would have been drawn away from the complainants under such circumstances is uncertain, and in this respect any conclusion must necessarily be speculative, but so long as such field is limited and guided by controlling facts the result cannot be far out of the way — are and is approximately, at least, with- the sphere of "actual damages." For these reasons and others I think it fair to conclude that the complainants would have sold fully seventy-five per cent. of the equalizers made and sold by the defendant had he not been an infringer and in the market. Up to January 1st, 1884, the defendant sold 7,550 sets of equalizers of ½-inch steel. Of this number I find that complainants would have sold 5,660 had defendant not been a competitor in the market. The proof shows that complainants during that period sold their equalizers at a profit of 92.3 cents.

Their damage on the 5,660 equalizers made and sold by the defendant would have been $5,224.17. After January 1st, 1884, defendant made and sold on the same basis of calculation 1,642 sets of equalizers of ½-inch steel, which complainants would have sold had

defendant not been in the market, and upon which complain-
268 ants are entitled to recover their profit, which would have been 67¼ cents per set, or $1,104.24.

Beginning with February 11th, 1884, and ending April 28th, 1885, it appears from Defendant's Exhibit No. 2 that he sold 3,100 equalizers made of rods ⅝ inch and larger.

I am of the opinion from the evidence that had the defendant not been an infringer and thereby a competitor of complainants they would have sold at least 2,325 of that number. Their profits of that equalizer would have been 67¼ cents each, or $1,563.56, upon the number stated. The same exhibit shows the defendants made and sold 1,451 sets of ½-inch rods, of which I am of the opinion the complainants would have sold at least 1,000. Upon this number their profits would have been 69.8 cents each, or $698.00, upon the number stated.

Defendant's Exhibit No. 6 shows that after April 30th, 1885, he sold 35 sets of ½-inch rods and 642 sets of ⅝-inch rods, of which number complainants would have sold 480 at an average profit to them of 68½ cents each, or $326.40. Upon the equalizers so made and sold by the defendant, as above enumerated, I am of the opinion that the complainants have sustained damages to the sum of $3,916.37, which sum the defendant should be ordered to pay to the complainants.

The latter claim additional damages by way of losses sustained on a large amount of their equalizers sold at reduced prices because of the defendant's infringement and sales at lower prices, but this competition occurred during a period of great prostration in all kinds of manufacturing business, when even producers protected by established patents were following the general depreciation
269 in manufactured goods of every class, and I do not think their claim for damages upon that ground should be allowed.

I file herewith the testimony and exhibits taken before me, marked Exhibit- A and B, and ask that the same be considered a part hereof.

All of which is respectfully submitted.

A. J. RICKS,
Special Master.

(Endorsed :) Special master's report. Filed Oct. 11, 1886. A. J. Ricks, clerk.

270 Prices of connecting rods were in 1880 and 1881—

½ steel, per set	.81¼	cents
⅝ iron, "	.65	"
¾ " "	.81¼	"

In December, 1881, several months before we had any idea I. N. Topliff intended to make rods, and long before he purchased his first material for rods, we advanced the prices to the prices already given for 1882, viz:

½ steel, per set	1 12½
⅝ iron, "	90
¾ " "	1 12½

GEO. H. ELY.

271 *Cost of Connecting Rods.*

⅝ rods:

	Cts.
5 feet ⅝ iron, at 1.02 lbs. per foot—5.1 lbs., at 1.90	9.69
Iron for 8 links, 30 & ½ oz.—1.90625 lbs., 3⅜	6.43359
Press-work per set	.5
Making, except press-work, per set	5.5
Coal, 2½ lbs. per set—coal, $5.00 per ton	.625
	22.74859

½ rods, steel:

	Cts.
5 feet ½ steel, at .669 per foot—3.354 lbs., at 2.60	8.7204
Iron for 8 links, 23 oz.—1.4375 lbs., " 3⅜	4.8516
Press-work	.5
Making, except press-work	5.5
Coal, 2½ lbs. per set	.625
	20.197

Prices.

	1882 & '3.	1884–'5 & '6.
½ steel, per set	1 12½	90
⅝ iron, "	90	90
¾ iron, "	1 12½	1 12½

Sales.

	1882.		1883.		1884.		1885.		1886.	
January	1,374		312		853		83		614	
February	1,019		725		838		383		398	
March	695		677		751		476		852	
		3,088		1,714		2,442		942		1,864
April	1,347		923		600		600			
May	849		618		560		342			
June	634		804		602		147			
		2,830		2,345		1,762		1,089		
July	1,439		1,030		453		646			
August	1,051		578		303		288			
September	425		770		205		276			
		2,915		2,378		961		1,210		
October	535		309		62		62			
November	459		507		99		225			
December	54		183		17		300			
		1,048		999		178		587		
Total		9,881		7,436		5,343		3,828		

1880	8,485
1881	9,966

Complainants' Exhibit 1, A. J. Ricks, master.

272 In the Circuit Court of the United States for the Northern District of Ohio, Eastern Division.

TOPLIFF & ELY
vs.
ISAAC N. TOPLIFF. } Testimony Taken Before A. J. Ricks, Special Master.

FRIDAY, *March* 26, 1886.

Present: H. S. Sherman, Esq., on behalf of complainants; Hon. W. W. Boynton on behalf of defendant.

ISAAC N. TOPLIFF, being sworn, testified as follows:

(By Mr. SHERMAN:)

Q. State the date when you began to make these equalizers.

A. I think in the early part of 1884.

Q. How many sets of equalizers did you sell from the time you first began in the early part of 1884 to the end of that year?

A. I do not know.

Q. Have you any means of reaching that result?

A. Yes, sir; the books.

Q. Where are your books?

A. At the office.

Q. Did you have anything to do personally with returning to the book-keeper the number sold or the amount of the cost?

A. No, sir.

Q. So that you have no personal knowledge of the number of equalizers sold, how they were sold, and whether all that were sold were put on the books or not, have you?

273 A. No, sir; I believe they were all put onto the books.

Q. Do you know the number of sets sold?

A. Only as the books show it. I do not remember. I have not counted them up.

Q. Do you know as to the detailed cost of these equalizers that you made and sold during this period, except from your books?

A. That is all.

Q. Do you know whether these equalizers were made by your men by the *peice* and paid for by the *peice*?

A. They were not made by the *peice*.

Q. By your employees whom you paid by the day?

A. By day labor; yes, sir.

Q. Have you examined this statement that is presented here to see how much is charged for labor?

A. I have not examined it carefully; no, sir.

Q. Do you know, of your own knowledge, whether the labor that is charged in this statement was labor expended on these equalizers alone, or was labor that was partly expended on them and partly on other things?

A. Nothing more than the men's time that was charged that we kept specially for equalizer business.

Q. And that time that you kept specially for this purpose was entered on your books?

A. Entered on my books; yes, sir.

Q. Do you know the rate of wages that you paid from time to time?

A. Yes, sir.

Q. Is that shown in your books?

A. Yes, sir.

274 Q. Do you know the number of men employed by you from time to time on this particular branch of manufacture?

A. Yes, sir.

Q. And is that shown on your books?

A. Yes, sir.

Q. Do your books show the different amounts of material used in the manufacture of these equalizers and the cost of that material?

A. Yes, sir.

Q. Have you charged up against the manufacture of these equalizers anything but the labor and the material used in them?

A. No, sir.

Q. What do you mean by the first item in this statement shown me—"1 60-lb. hammer and shafts, &c."?

A. That is a hammer for welding and forging.

Q. Have you that hammer yet?

A. Yes, sir.

Q. In what condition is it?

A. It is a second-hand *m*ammer that we have had in use.

Q. Have you the dies that are shown in this statement?

A. Yes.

Q. Have you the furnace and settings that are shown there?

A. Yes.

Q. The emery-grinder, shaft, etc.?

A. Yes.

Q. And the emery wheel?

A. We have used up a good many emery wheels.

Q. Have you charged for more than one emery wheel on this?

A. I presume so. There have been a good many used.

275 Q. And was that emery wheel used solely for this purpose?

A. I think it was used on purpose for that.

Q. And all the emery wheels that you have charged here were used solely for that?

A. Yes.

Q. In what way did you use the emery wheels in the manufacture of these equalizers?

A. For grinding off the ends and smoothing them up, in the place of files.

Q. The belting that is charged here you have still, have you?

A. We have it. It is old belting, I suppose, some of it, and some of it is worn out, likely.

Q. Have you charged for more than one set of belting?

A. I do not know. I think only one set.

Q. Was this first lot of steel—30,225 pounds—on hand at the time you began to make these equalizers?

A. I got it about the time I began to make them; yes.

Q. Did you have it on hand at the time?
A. At the time I began to make them; yes, sir.
Q. Was it purchased for that purpose?
A. Yes.
Q. And the price that you have put opposite—"3½"—means three and one-half cents a pound?
A. Yes, sir.
Q. Was that the price you paid for it?
A. Yes, sir; I suppose so.
Q. Do you remember paying that price for it?
A. As near as I can remember, that was about the price that we paid for steel at that time.

276 Q. How about the punch, the plate, and the dies that are charged here? Are they in your possession yet?
A. I think so; yes, sir.
Q. How much of the 30,225 pounds of steel did you use for the purpose of making equalizers?
A. We have used all, perhaps, but about five or six tons of it. I think we have five or six tons now on hand.
Q. Is that manufactured into equalizers?
A. No, sir; not much of it. Some of it is.
Q. Have you given any credit for that on this statement?
A. No, sir.
Q. How about the 1,205 pounds of steel in January, 1884? Is that all used up?
A. Oh, yes; that was all used up?
Q. And used up in the manufacture of equalizers?
A. Yes, sir.
Q. What is the market price of the same kind of steel now that you bought in December, 1883, being these 30,225 pounds?
A. I have not bought any for a good while; I do not know really what it is worth.
Q. Would you say more or less?
A. It is worth less now. I have not bought any for a year.
Q. How much less?
A. I should say that it would be worth a cent a pound less, and maybe more; but it is worth, I should say, that less, anyway.

Whereupon the further taking of testimony was adjourned until Monday, April 5, 1886, at 10.30 a. m.

277 MONDAY, *April 5*, 1886.

Same parties present.

Examination of I. N. TOPLIFF resumed by Mr. SHERMAN:

Q. Referring to the statement that you show here of the cost of equalizers and the amount received for sales during the period from January, 1884, to the date of the decree, it would seem, according to this statement, that you made a loss in the manufacture and sale of these equalizers. Is that true?
A. Yes, sir.

Q. What percentage of loss on your manufacture the first year?
A. I do not know; I never have figured it up.
Q. During the whole period about what would be the percentage?
A. I do not know.
Q. Your cost of manufacturing, according to this statement, was $3,000 in round $4,700, and the amount received from sales was $1,460, which you call a numbers, leaving a balance of nearly loss. What would be the percentage of that loss in round numbers?
A. I do not know; I never have figured it out.
Q. It would be about forty per cent., would it not?
A. I should think from thirty to forty per cent.
Q. When did you first discover that you were making a loss on this?
A. Why, I knew I was all the while.
Q. From the very beginning?
A. From the very beginning—yes, sir; I did it because I was driven into it.
Q. Driven into what?
278 A. Driven into the manufacture of equalizers in order to sell the bow socket.
Q. When did you first begin to make these equalizers?
A. The wrought ones in the fore part of 1884; the malleable ones in 1883.
Q. Did you make any in 1882?
A. I think not. There might have been a few sets made the last part of the year, but I think not.
Q. Do you remember that in your testimony on the hearing of this case you stated that you began to make them in the latter part of 1881 or the first part of 1882?
A. I might have thought so at the time, but I think it was later than that that I began making malleable ones. I have not looked that up exactly.
Q. How many equalizers did you make during the year 1882?
A. I do not know.
Q. Will your books show that?
A. Yes, sir; I think so.
Q. Will you furnish to the master a statement of the number of equalizers made during the year 1882 and during the year 1883?
A. Yes, sir.
Q. This statement that you have shown here covers all that you have made and sold during the years 1884 and 1885?
A. All of the wrought ones; not any malleable ones.
Q. Did you make any malleable ones after the year 1883?
A. Very few indeed.
Q. Will your books show how many of those were made?
A. I think so; yes, sir.
Q. Will you furnish a statement of the number of malleable
279 ones you sold during those two years?
A. Yes, sir.

Q. Did you make any wrought ones prior to 1883?

A. No, sir.

Q. Which could you make cheaper—the wrought or the malleable?

A. The malleable, some cheaper.

Q. How did the number manufactured in 1882 and 1883 compare with the number manufactured in 1884 and 1885?

A. I think there were a good many less in those years. A good many objected to the malleable equalizers. They broke, and purchasers had trouble with them and sent them back. There were a great many returned.

Q. Which is more poor?

A. What did

Q. And which did not take well?

A. No, sir.

Q. And did not wear well?

A. They had a good deal of trouble with them.

Q. You say that you were driven into the manufacture of these; that was in 1881 or 1882?

A. In 1882, I think, that we began to get our patterns ready.

Q. When you testified before that you began making them in the early part of 1882 you were mistaken, then?

A. I think it was the latter part of 1882.

Q. Your books will show, will they not, just when?

A. Oh, yes, sir.

Q. In making out the statements I have called for will you give the dates also when you commenced to make them?

A. Yes, sir.

280 Q. What do you mean when you say you were driven into the manufacture? By whom were you driven?

A. Customers would not buy the sockets of me unless I would furnish them equalizers to go with them.

Q. Some years prior to the time you began making these you had been in some way connected with Topliff & Ely in the manufacture of bow sockets and these equalizers, had you not?

A. Yes, sir.

Q. The ones that Topliff & Ely were making at the time you were familiar with their business or connected with them were made under a patent, were they?

A. I believe they claimed to have a patent; yes, sir.

Q. You knew that to be the fact, did you not?

A. No; I don't know that I did.

Q. You never saw the patent?

A. No, sir; I think I never saw it.

Q. You were told that they had a patent?

A. I don't know whether I was ever told or not, but I had heard that they had one.

Q. Then when you testified in your former examination that you knew they had a patent at that time you were mistaken in that, were you?

Objected to.

Q. In your examination on the hearing of this case, in answer to the question, "You had knowledge at the time (referring to the first of the year 1882) of the existence of the Topliff & Ely patents, had you not?" you replied, "Yes, sir."

A. I had knowledge; yes. It was simply from reputation.

Q. It is true you had knowledge of them? a

281 A. I had heard that they had patents, but never saw them that I remember of.

Q. You were selling these rods at that time for Topliff. You saw the rods, did you not?

A. Yes, sir.

Q. These rods were stamped "patented" accordingly, were they not, when you saw them?

A. I don't know whether they were stamped or not.

Q. Did you never see the stamp on them?

A. I don't remember that I did; no.

Q. Do you mean to say that you did not see any stamp on them?

A. I have no recollection of seeing any stamp; still there might have been. I saw very few of the goods that I sold.

Q. Referring again to this statement of the cost of equalizers, it does not contain the total cost of all the equalizers that you made from the beginning?

A. Not of the malleable ones; no, sir.

Q. This statement simply includes the cost of making the wrought ones?

A. Yes, sir.

Q. Have you the invoice of the hammer and shafts with you today?

A. No; I have not.

Q. Have you those originals in your possession?

A. No; I have not. That hammer was bought from W. H. Parkin and paid for in cash.

Q. And this is the true amount you paid for it?

A. $444 was what we paid for the hammer, and then the other is for setting, co-nter-shaft, and freight. That was a simple

282 cash transaction.

Q. When was this hammer purchased and set up and put to work?

A. Some time in the latter part of 1883.

Q. It is marked here "December —." Some time in December?

A. Yes, sir.

Q. Was that hammer purchased solely for the making of these rods?

A. Mainly for that.

Q. Was it ever used for anything else?

A. Very little, indeed.

Q. What else did you use it for?

A. We did a little forging on it.

Q. For what?

A. For drasing out mandrels or something like that or drawing out tools; it is mainly for that.

Q. What proportion of the whole work done with this hammer was done on articles other than the equalizing rods?

A. Oh, we might have used it one day in thirty for something else.

Q. Not more than that?

A. No, sir; not more than that.

Q. Where is the hammer now?

A. [illegible] many [illegible]s in my factory.

Q. [illegible] chasers [illegible] hat condition is it in?

A. [illegible] great [illegible] is in a fair condition.

Q. What did you value it at in your last inventory?

A. About $175, I think.

Q. Have you the inventory with you?

A. Yes, sir.

Q. Will you refer to it and state at what you inventoried that hammer and the shafts that you have marked on your state-
283 ment here at $480.25?

A. The inventory was taken on sheets and then figured up as a whole—so much for machinery—so that I have no separate inventory that was taken last January of that.

Q. What percentage of the original cost did you deduct for wear and tear of machinery when you took that inventory?

A. I do not remember what percentage.

Q. How is your machinery inventoried—as a lump?

A. As a lump; yes, sir.

Q. Does that inventory show the original cost of the machinery?

A. No, sir.

Q. Do your books?

A. Yes; I think they would.

Q. Will you, then, prepare a statement showing the total cost of your machinery and the total amount at which it was inventoried in the last inventory, to get the percentage that you have taken off for wear and tear?

A. Yes.

Q. What price did you put it at?

A. I appr-ised it at $175. That is what Mr. Smith thought it was worth and what it would sell for now.

Q. Does that include the shafting?

A. Yes, sir.

Q. Includes everything connected with that hammer?

A. Yes, sir. It might *for* for $200, but it would not bring any more than that.

Q. Then it has depreciated more than half?

A. We got two hammers down at the Parkin File Company's in about the same condition—bought about the same time—
284 and one of those went for $200 and the other for $150.

Q. That was sold at forced sale, was it not?

A. Yes.

Q. Cash?

A. No; not cash.

Q. At assignee's sale?

A. One of them was and one was sold before the sale.

Q. Is not that hammer and shafting worth to-day fifty per cent. of what you paid for it?

A. It would be if any one wanted it—had a business for it; but if they had not a business for it, it would not be worth that.

Q. That price at which you have inventoried it, $175, represents the price that you think it is fairly worth to somebody who wanted a machine of that kind?

A. Yes; who wanted a machine of that kind.

Q. And that is as high a price as you will put on it?

A. That is as high as I think it would sell for.

Q. And you would sell it for that to-day?

A. I don't know that I would sell it for that. I think that is about what it would sell for—from that to $200.

Q. How about the furnace and the emery grinder?

A. The furnace is in fair condition.

Q. How much did you inventory that at?

A. $20; it is an old furnace and burned out some.

Q. How much did you inventory the emery grinder and shaft at?

A. $15.

Q. When did you buy these 30,225 pounds of Bessemer steel?

285 A. I could not say exactly when.

Q. Did you buy it all in one lump?

A. Oh, no.

Q. When did you buy the first part of it?

A. We bought some in 1882, I should presume.

Q. What was the first lot you bought?

A. I do not remember.

Q. Do not your books show that?

A. I presume they would; yes.

Q. Your books are here, are they not?

A. I think so. Mr. Smith tells me that that first amount was taken from the inventory that we had on hand when we began making the rods.

Q. Then you did not buy that for that purpose at that time?

A. Not at that time; no, sir.

Q. What inventory did that appear in?

A. January 1st, 1884.

Q. Have you the original invoices of these various amounts of steel that go to make up these 30,225 pounds?

A. No, sir; we do not keep our invoices a great while. The books would show it all, though.

Q. Will you make out a statement and hand it to the commissioner, containing the dates when purchased and the amounts of this steel which go to make up this 30,225 pounds in this statement?

A. Yes, sir.

Q. How far back do the invoices which you have in your possession run?

A. I do not know, sir; I have not looked them up, but I know we do not keep them a great while.

286 Q. How long?

A. A year or two, perhaps.

Q. And then you destroyed them?

A. Yes. Mr. Smith told me that the old invoices had all been burned up.

(By Judge BOYNTON:)

Q. Smith was your book-keeper, and he would know all about it, would he not?

A. Originally; yes.

(By Mr. SHERMAN:)

Q. During this period?

A. Yes.

Q. Is that true of all your invoices in your business?

A. Yes; we do not keep them any great length of time.

Q. Had you any object in burning them up?

A. No; and no object in keeping them that I know of.

Q. How much of this 30,225 pounds of steel have you on hand now?

A. 7,300 pounds.

Q. Has all the balance gone into the manufacture of equalizers included in this list?

A. Yes, sir; I suppose it has.

Q. No part went into the equalizers that you made before this?

A. No, sir.

Q. And you used the difference between these two amounts in equalizers that have been made since January 1st, 1884, down to date?

A. Yes.

Q. Or down to the taking of this decree and what few you have made since?

A. Yes.

287 Q. Did you usually send the sets out in two pieces or four pieces?

A. Sometimes in two and sometimes in four.

Q. Which the most?

A. I think the most in two.

Q. Of what length were those pieces?

A. They would vary from twenty-four inches to thirty inches; thirty-two or thirty-three inches, perhaps, sometimes.

Q. Do you make any shorter than twenty-four?

A. Very seldom.

Q. And longer than thirty inches?

A. I think so; yes; sometimes thirty-two or thirty-three.

Q. Does your invoice book show the length of the pieces?

A. Not generally; no, sir.

Q. Simply the weight?

A. No; just the number of sets. That is all.

Q. Which did you sell the most of—above twenty-four inches or below?

A. We sold more above; generally about thirty inches long.

Q. That would be about the average?

A. I should think twenty-eight to thirty; somewhere along there.

Q. Your book*ds* would not help you there?

A. No.

Q. In making out the statements I have called for of the total sales from the time you began to make them down to the last one you made and sold, will you please make those statements for each year separately down to February 11, 1884?

A. Yes.

288 Q. The last one you sold, according to this statement, was April 28. Have you sold any since then?

A. Yes, sir.

Q. Will you please make a statement of all equalizers that you have sold since April 28, without regard to whether they are wrought or malleable?

A. Yes, sir.

Q. Have you made any wrought since then?

A. Yes, sir.

Q. Have you made any outside of those that the court allowed you in this decree to make?

A. Yes, sir.

Q. How many of those have you made?

A. I do not know how many; not such a great many.

Q. Please hand to the commissioner a statement of all equalizing rods that you have made since the entering of the decree in this case, and if you claim that any of those equalizing rods do not come within the decree or the injunction issued in this case attach to that statement a sample of those rods.

A. I will do so.

Q. You understand that all the equalizing rods that you have manufactured since the entering of this decree which you claim to be rods that are not within the decree or embraced within our patents you will render a statement of and attach a sample of each kind, if there is more than one kind?

A. Yes.

Q. In this statement that you have furnished you have placed the cost of selling, advertising, office expenses, etc., at ten per cent.?

289 A. Yes.

Q. Ten per cent. of what?

A. Ten per cent. of the selling price.

Q. How do you reach that?

A. It is simply an estimate of about the expenses attached to it ordinarily. I usually pay about five per cent. commission to travelling men.

Q. Five per cent. of the selling price?

A. Yes.

Q. Have you paid that uniformly on the sale of these particular items?

A. As a general thing, I have.

Q. What percentage of your total business does the cost of selling, advertising, office expenses, etc., amount to?

A. Come very near ten per cent. if not over—advertising, and commission, and everything.

Q. What is included in that ten per cent.?

A. Office expenses, advertising, travelling expenses, and commissions to agents. Insurance, perhaps, might come in.

Q. Anything for power and fuel, or do you enter that separately?

A. We enter that separately.

Q. You have charged wages for man and helper; you have taken this from your time book?

A. Yes.

Q. And the time that you have charged for was spent solely in the making of these equalizers?

A. Pretty much; yes, as near as we could get at it.

290 Q. Did you employ these two men that you have mentioned here continually in this business?

A. Yes, sir.

Q. Or did they do other work?

A. They were most of the time at that business.

Q. What proportion of the time?

A. I should say that they would not be employed at other business more than one day or two days, perhaps, in a month. They might be fixing up tools or something like that; but that was their business.

Q. Have you ever figured, in figuring up your manufacture of equalizers, what percentage the labor on them has cost you?

A. No; I have not.

Q. It figures about twenty-five cents a set. Do you think it cost you that much for every set you made?

A. I think in that neighborhood; yes, sir; the way that I had to make them. I did not have enough to keep the men all the while at it; if I had we could have made them some cheaper.

Q. Have you given any credit in this statement for the time that these men have worked on other things?

A. Oh, we didn't charge full time for the two men.

Q. Did you charge anything more than the time actually employed and paid for by you in this work?

A. We do not intend to; no, sir.

Q. Do you know whether you have or not?

A. We have charged about the time that they were employed.

Q. You made an estimate of that?

A. Yes, sir.

291 Q. It is simply estimated?

A. Yes.

Q. And according to that estimate it cost you in the neighborhood of twenty-five cents a set for labor?

A. Yes, sir; if you have figured it out correctly.

Whereupon the further taking of testimony was adjourned until Saturday, April 10, at 10 a. m.

SATURDAY, *April* 10, 1886.

Same parties present.

Examination of I. N. TOPLIFF resumed by Mr. SHARMAN:

Q. Have you a statement of the number of equalizers made during the years 1882 and 1883?

A. Yes, sir—that is, the malleable.

Q. In this "Exhibit 3" what do these figures in the right-hand column represent?

A. The number of sets.

Q. This statement, "Exhibit 3," contains a true statement taken from your books of the total number of equalizers sold by you since April 8, 1882?

A. Yes, sir.

Q. And April 8th is the date of the first sale of any equalizers made by you?

A. Yes, sir.

Q. These are all malleable sets?

A. Yes, sir; except the last item.

Q. You were asked to prepare a statement showing the total cost of machinery and total amount at which it was inventoried in last inventory to get percentage that you have taken off for
292 wear and tear. Have you prepared that statement?

A. Yes, sir.

Statement produced and marked "Exhibit 4."

Q. You were asked to make out a statement containing the dates when purchased and the amounts of steel which go to make up the 30,000 pounds in your statement, "Exhibit No. 1." Will you produce that statement?

A. Here it is. (Statement marked "Exhibit 5.")

Q. What kind of steel is this—what size?

A. Most of it is half inch.

Q. And the last purchase you made was on October 31st, 1883?

A. I suppose so, if it says so there. I have not had time to look that over. We did it in a good deal of a hurry. The last purchase before the 1st of January, 1884, you mean?

Q. Yes, sir. What I want to get at is how much of this large quantity that you bought in March, 1882, and January, 1883, you had on hand October 31st, 1883. Why did you make this purchase of October 31st, 1883, if you had a large quantity on hand?

A. Is it not a different size or something?

Q. That is what I don't understand; it is not marked here.

A. I don't know.

Q. What do you say about these small quantities—1,000, 440, 196 pounds, etc.—as to the size represented by those quantities?

A. Those, perhaps, would be some $\frac{5}{8}$ or $\frac{9}{16}$ or some size that I had not got in large quantity.

Q. A different size from the regular?

A. Yes.

Q. And the large quantities mentioned in this statement are the half-inch steel?

293 A. Yes, sir.

Q. Have you made out a statement of your total sales from the time you began to make them down to the last one you made and sold separately by years, as called for?

A. Yes, sir; I believe that includes it.

Q. That statement is included in "Exhibit No. 3" that you have produced?

A. Yes, sir.

Q. The statement, "Exhibit 3," contains the number of malleable equalizers?

A. Yes, sir.

Q. And the statement, "Exhibit 2," which you handed to the commissioner last week is a statement of the number of wrought-iron equalizers?

A. The number of wrought-iron ones in 1884 and 1885. Those are 1882 and 1883.

Q. Did you make any wrought-iron ones in the years 1882 and 1883?

A. No.

Q. Then these two lists, "Exhibits 2 and 3," contain a statement of the total number of sets of all kinds that you made from the time you began making them?

A. Yes, sir; in the list of those malleable ones there were a great many returned in 1882 and 1883. Those are not noted.

Q. In any of the statements you have offered here to-day is it shown how many equalizing rods you have made since the entering of the decree in this case?

A. Yes, sir; 291 sets of the malleable ones here.

Q. How many of the wrought?

A. 677 set.

294 Q. Have you a statement containing the number of wrought?

A. Yes, sir. (Paper produced and marked "Exhibit 6.") This (Exhibit 3) contains 611 set of wrought of the new style or Stringfellow patent also.

Q. "Exhibit No. 6" shows the total number of equalizers sold by you since the date of the decree in this case, does it?

A. Yes, sir; all of the equalizers.

Q. Malleable and wrought?

A. No, sir.

Q. What does it show—what kind of equalizers does this statement cover?

A. The kind that I was decreed not to make, as I supposed; not the malleable nor the new kind—the Stringfellow. It does not include either of these.

Q. It simply contains a statement, then, of the total number of wrought-iron equalizers?

A. Yes, sir; wrought iron; not wrought iron of the new style.

Q. Have you made any malleable-iron equalizers of what you call the old style since that decree?

A. Yes, sir.

Q. Have you a statement of that?

A. 291 set.

Q. And that is contained in "Exhibit No. 3," is it?

A. Yes, sir.

Q. How many of what you call the new style of equalizers have you made since the entry of the decree in this case?

A. 611 set.

Q. Have you with you a sample of that new style and will you produce it and have it markes "Exhibit A"?

295 A. Yes, sir; it is in three different varieties—the same principle. I did not know whether you wanted them all or not, and so I brought them.

(Witness produces three varieties of what he calls the new style and which he claims are not made under the patent in suit, and which are marked "Exhibits A, B, and C.")

Q. Taking your statement of equalizers sold since the entry of this decree, you may state whether those sales are covered by orders that were received prior to the taking of the decree.

A. Yes, sir; I believe they were.

Q. And you have filled no orders for equalizers that have been received since the entry of the decree and the service of the injunction upon you?

A. You are speaking of that style?

Q. Of equalizers under the decree.

A. No, sir.

Q. And you have undertaken yourself to decide what style of equalizers comes under that decree and what does not?

A. With the assistance of my attorneys.

Q. You have sold the number contained in the last item of your statement, "Exhibit 3," of equalizers for carriages since the taking of the decree?

A. Have sold a number.

Q. Upon what ground and for what reason do you say that the equalizers shown in models A, B, and C are not within the decree and the injunction in this case?

A. They are different in their construction.

Q. Please take those exhibits and state in what way they

296 differ in construction or operation from the equalizers you made prior to the entry of the decree.

A. This rod runs straight through here. This main rod is in the place of this little rod—this short rod at this point, in the old style—and it is hung from that main rod instead of being hung from the side rod.

Q. Is there any difficulty in a carriage-maker taking that rod and

hanging it in the way you hung the rods before you made this style?

A. No, sir; no difficulty.

Q. If he did hang it in the same way that he hung the rods manufactured by you before the decree, would it not be the same equalizer?

A. No, sir.

Q. Why not?

A. Why, it is not hung from the main shaft.

Q. I ask you whether he could not hang it from the main shaft?

A. He could hang it from that.

Q. If he did so, would it not be the same equalizer that you made before the decree?

A. Yes, sir; in "Exhibit C" this main rod runs straight through and connects here, and there is no rod here (indicating).

Q. These are all the kinds that you have made since the entry of the decree, except those that you made upon orders received before the entry of the decree?

A. Yes, sir; there was a very few set that I made a little different in here, but not but a few, with a bend around here.

Q. Are they in substance the same as those?

A. The principle in substance is the same as those.

297 Q. How many different kinds other than the three you have produced have you made?

A. Oh, I only made a few of them.

Q. How many kinds?

A. Just one other kind.

Q. Will you produce a sample of that, too, before the close of this examination?

A. I have only made a few and found that I could not make them so cheap as I could this way and changed them.

Q. Produce one, and have it marked "Exhibit D" when produced.

A. Yes, sir.

Q. How did you sell this new kind of equalizer—at what price?

A. I think the half-inch ones were sixty-five cents a set; I am not certain—I don't remember prices very well—and the ⅝, 75. It is my impression that that was the price; still it may be five cents less.

Q. In your statement of the number of this new kind that you have made you did not separate the different sizes, did you?

A. No, sir.

Q. Can you state about how many of each kind you made?

A. I could not.

Q. How much did they cost per set?

A. I don't know that.

Q. Can you give any idea how much?

A. No, sir.

Q. How did their cost compare with the cost of the kind you had been making?

A. Well, these cost as much; perhaps a little more.

298 Q. Then if you made the other kind at a loss in their manufacture you were making these at a loss, too?

A. I presume so. Oh, yes, I have no doubt that we were.

Q. You have stated that from the very beginning of your manufacture of these equalizers you were making them at a loss and that you knew all the time that you were making them at a loss, and you have stated that you knew or had heard during your manufacture or prior to the time you commenced manufacturing that Topliff & Ely had a patent or patents for them. I wish you would explain to the master your reasons for continuing the manufacture under those circumstances.

A. It was for the accommodation of our customers; those that bought bow-sockets.

Q. If you were making them at a loss, as you say, why did you sell them for the price you made?

A. It was as much as we could get for them.

Q. Did you know the prices Topliff & Ely were getting for theirs?

A. I think so.

Q. How did those prices compare with those you were getting?

A. I don't remember.

Q. Were they not much greater?

A. No; I think not.

Q. Were they not greater?

A. I think not.

Q. Did you ever see their price-list?

A. Yes, sir; I have not seen one for some time, though.

Q. At the time you did see it you were selling these equalizers for prices less than those in Topliff & Ely's price-list, were you not?

299 A. We were selling ours at net and theirs was listed, and Topliff & Ely gave a discount, I think, but I don't know what the discount was that they gave.

Q. Didn't you know during all this time that you were selling for less than Topliff & Ely were selling?

A. No, sir.

Q. Didn't you intend to do it?

A. No, sir.

Q. Was not that the reason for fixing your price so low?

A. I intended to get all I could for them.

Q. Didn't you intend to sell them at less than the price Topliff & Ely were selling them at and didn't you understand that you were selling them for less price than Topliff & Ely?

A. I don't know that I knew what price they were selling them for more than what I would hear from my customers.

Q. What did they say about that?

A. They would tell me what they could get them at from Topliff & Ely.

Q. And you made it less, didn't you?

A. Not generally; no, sir.

Q. You did in particular cases?

A. Perhaps in some cases, slightly.

Q. Do you mean to say that you did keep up in all your sales, so far as you knew, the prices Topliff & Ely were getting; keep up in your sale with those prices?

A. No, sir; I didn't say that.

Q. And you don't want the master here to understand that you did?

A. That I was governed by their prices? No, sir; not at all.

300 Q. Would there have been any difficulty in getting the same prices that Topliff & Ely got?

A. I don't know; there would in some cases, perhaps.

Q. Those would be mere isolated cases, would they not? Generally on the market you could have got as much for your goods as Topliff & Ely, could you not, if you asked for it?

A. Why, I don't know but I did.

Q. Do you know you did?

A. No; I don't know that I did.

Q. Don't you know you didn't?

A. No; I don't know that, but generally in some cases, perhaps.

Q. What proportion of these malleable iron equalizers did you have returned to you?

A. I could not tell you without looking up the book.

Q. A very large proportion, was it not?

A. There was a good many the first two years.

Q. Why were they returned—what was the reason?

A. Sometimes they were not the right size and sometimes they broke. People objected to them.

Q. For which cause were the most returned?

A. I don't know that I could tell that without looking up the causes for returning.

Q. Why did you stop making that kind, then?

A. Because we thought the wrought ones would be better.

Q. And you were told so by the trade generally, were you not?

A. Yes, sir.

Q. That the wrought ones gave better satisfaction?

A. Yes, sir.

Q. The malleable iron ones were rather a poor thing, were they not?

A. Why, a good many of them were.

301 Q. As a rule?

A. Yes; although there are some customers who like them now.

Q. In making up your statement before the master here or in testifying as to fact that you derived no profit from the manufacture and sale of these equalizers did you in making that estimate or statement allow or deduct your losses from defective manufacture and from those returned? Were those items included in you losses?

A. Those that were returned?

Q. Returned as defective or broken or for any reason returned.

A. They were returned and entered into the stock, and then perhaps were sold to other customers.

Q. In making up this statement did you deduct those returned from your profits or from your sales?

A. From the sales—yes, sir.

(By Judge BOYNTON:)

Q. That is, you counted them as sold but once?

A. Counted them as sold but once; yes, sir.

(By Mr. SHERMAN:)

Q. Then you have shipped out more than appears in this statement, some of which were returned and you sent them out again?

A. In the first statement; yes, sir.

Q. In the second statement, "Exhibit 3," the malleable?

A. No; that shows all that we shipped out, and then there is another item showing what was returned.

Q. Where is that item?

A. That is on that same sheet, I think.

Q. This only shows the number of wrought returned.

302 Have you any statement showing the number of malleable ones returned?

A. No, sir.

Q. Does this statement of the number of malleable ones sent out, "Exhibit No. 3," represent the total number sent out or the total number sold?

A. The total number sold, that represents—sent out.

Q. If one has been sent out and then it is returned and sold again, does it count as two in this statement that you have made?

A. Yes, sir. It might be sent out two or three times.

Q. What is the difference between the malleable and wrought iron equalizers in operation?

A. They operate the same.

Q. The difference is only in making the heads or links of malleable iron instead of wrought iron, is it not?

A. There is a different manner of constructing. It is a loose head driven onto a rod. Instead of being welded on solid, it is simply a loose head driven on.

Q. Now, suppose you deduct from your sales all that you lost in defective work that was returned on your hands; what would you say, then, as to whether you made any profit on the manufacture?

A. On the malleable or the wrought?

Q. On the malleable first and then on the wrought.

A. I have not figured up the cost of the malleable at all.

Q. You don't know whether you made a loss or a profit, then, on the malleable?

A. No, sir; I don't know, but I think I made something on the malleable.

303 Q. I will ask you how much it cost to make a malleable set?

A. That I don't know.

Q. Have you any means of finding out here?

A. No, sir.

Q. Will you prepare a statement and hand it to the master within the next two or three days of the cost and receipts — of the profit you made on the malleable equalizers that you have made or sold from the beginning?

A. Yes, sir.

Q. I think you have said that you have lost on this new style in the manufacture?

A. I think so. Yes, sir.

Q. Will you examine your books, and if you have made a profit on those state the amount?

A. Yes.

Q. You have stated that it has been your practice to burn your invoices of goods bought, and for that reason you are unable to show the invoices for the steel purchased and shown in "Exhibit No. 1." How long do you keep your invoices?

A. A year or two.

Q. Have you any rule about how long you keep them?

A. No.

Q. How often do you destroy invoices?

A. Why, I think we never have destroyed them, to my knowledge, but once. Mr. Smith said, in cleaning up the offices last January, there was a lot of these old invoices lying there, bundled up, and they thought they were of no use, and burned them up.

Q. When was that?

304 A. That was in January.

Q. Of this year?

A. Yes; last January. I found yesterday all of the invoices of 1881 pasted into a book.

Q. Did you find any later invoices than 1881 down to this January?

A. No, sir.

Q. What is your custom about entering in your books items of purchase?

A. We enter it into a purchase book.

Q. The amount of purchase?

A. Yes, sir.

Q. The price and the total amount paid?

A. Yes, sir.

Q. Do you always put the price and weight?

A. Yes, sir.

Q. In other words, do you copy into your books the substance of every invoice you get?

A. That is the intention; yes, sir.

Q. Then your books ought to show everything that an invoice would show?

A. Yes, sir.

Q. The date of purchase, the amount and weight of the goods purchased, and the price paid for them?

A. Yes, sir.

Q. Do your books show that with reference to all these items that you have put in your statement?

A. I think so; yes, sir.

305 Q. Where did you get this item of 30,000 pounds of steel and the price?

A. That was taken from the inventory book.

Q. What inventory?

A. The inventory of January 1st, 1884.

Q. Where did you get this statement of amounts purchased in 1882 and 1883?

A. Got that from the purchase books.

Q. The books you have been speaking of?

A. Yes, sir; but you asked where I got the amount of that 30,000. It was taken from the inventory.

Q. You did not take that from your purchase book?

A. No, sir.

Q. How much, if any, of that steel that is shown in your statement "Exhibit No. 2," 30,225 pounds, went into the malleable-iron equalizers made after the first of January, 1884?

A. I don't know how much.

Q. Did any of it go in there?

A. It very likely did, some of it; yes, sir.

306 GEORGE H. ELY, being sworn, testified as follows:

(By Mr. SHERMAN:)

Q. You are one of the complainants?

A. Yes, sir.

Q. And a member of the firm of Topliff & Ely?

A. Yes, sir.

Q. And their business is what?

A. Manufacturing carriage hardware.

Q. Where?

A. At Elyria.

Q. You may state whether you manufacture these equalizers that have been spoken of.

A. We do.

Q. How long have you been manufacturing them?

A. Since 1871.

Q. I will ask you what facilities you have for manufacturing them in large quantities and have had since 1881?

A. We have ample facilities.

Q. About how many can you make a year and have you been able to make a year, if demanded, since 1881?

A. We have never made over ten or twelve thousand set a year, but we could have made 50,000 set if it had been required without any addition to our machinery.

Q. Without any addition to your machinery or other appliances, save labor?

A. Simply by employing additional men.

Q. How many more men to increase your capacity?

A. That would depend on how many we were going to make.

Q. To increase your capacity by from three to five thou-
307 sand a year—say five thousand a year.

A. Well, two men will make ten thousand a year.

Q. About how many men did you employ?

A. We may at times have employed several and then at other times have had none working upon it. We may not manufacture continuously.

Q. Without increasing your machinery or other appliances, save labor, what would be and has been your capacity for making equalizers during the last five years—since 1881?

A. We have made all that the trade called for, and could have made several times that.

Q. I wish you would now give to the master a statement in detail, if you please, of the cost of making equalizers such as were shown in the testimony in this case.

A. In getting very accurately at the cost the price would depend somewhat upon the length of the rods, making a difference in the material used. Mr. Topliff in his testimony the other day gave thirty inches as an average length. Our experience is that it is much less than that. We make them down to 22 inches, and it is only in rare instances we make them as long as thirty inches, but in this estimate of cost I have taken what he gave as an average length, namely, thirty inches. There would be two pieces of iron thirty inches long. First, let me say I have given prices of two kinds here—$\frac{5}{8}$ iron and $\frac{1}{2}$-inch steel. That covers nearly all that is manufactured. Some $\frac{3}{4}$ are made, but those we sell for more, and the profit on those is greater than on these, because we get more than the additional cost. We never have made anything but $\frac{5}{8}$ wrought iron and half-inch steel. Two
308 pieces of thirty-inch iron would be five feet of $\frac{5}{8}$ iron, which weighs 1.02 pounds per foot. Five feet would weigh 5.1 pounds. At $1.90 this would be $9.69. That iron I put in at $1.90 a hundred. That was the price we paid for that at the time, delivered in Elyria. It takes two of these rods for a set, one at each end of the buggy, and there are eight links. The iron for those links weighs thirty and one-half ounces—that is, the iron as it is in the bar. The iron that it takes to cut those eight links out in a bar would weigh 30$\frac{1}{2}$ ounces, or 1.90625 pounds. That at three and three-eight-s cents a pound would be 6.43359 cents. That is all the material except coal. The work we do altogether by the piece, except cutting these links out upon a press. That press works continuously and cuts them right out, and it costs us less than half a cent to cut those out. A man will cut thousands of them in a day. I have put them in at half a cent a set. The price we pay for making them is 5$\frac{1}{2}$ cents a set. It takes two and a half pounds of coal to make a set, which, at five dollars a ton, would be .625 of a cent., making the total cost 22$\frac{3}{4}$, or, in a decimal, 22.748 cents a set. I have on this statement the price in detail of making the half-inch steel rods, showing the total cost of the steel ones to be 20.197 cents

per set. In this I have added nothing for office expenses, cost of selling, etc.

(By Judge BOYNTON:)

Q. Have you included the cost of transportation?

A. I have give- prices delivered in Elyria, and all our goods are sold at Elyria, so there is no transportation. The iron
309 from which we make these is rolled for us in Norway or Sweden; I don't know which. It is the very best Norway iron, and there is about as much waste to within a quarter of an ounce on a set as the material we use—that is, we take these links out, and the scrap that is left will equal the weight of the links. That is very desirable scrap, which we can sell at a good price, and what we get for that scrap will more than pay all the other expenses.

Q. You mean the office expenses?

A. Yes, sir; and other expenses. We sell a great many tons of it every year.

(By the MASTER:)

Q. That is, it will pay the office expenses assigned to this part of the work?

A. Yes, sir; our scrap will more than pay the expenses after the cost of manufacturing.

(By Mr. SHERMAN:)

Q. State what the cost per set of the $\frac{3}{8}$ iron and the cost per set of the half-inch steel rod is, manufactured into a set—the cost to you, including all cost and expenses of marketing the same?

A. The cost of the $\frac{3}{8}$ iron would be $22\frac{3}{4}$ cents. The cost of the half-inch steel would be 20.2 cents.

Q. As I understand you, that is the total cost to you of the equalizers when marketed?

A. Yes, sir.

Q. Now, give a statement of what prices you received for these equalizers during the years 1882, 1883, 1884, and 1885?

A. In the years 1882 and 1883 our prices, which are the lowest at which we sold, for half-inch steel were $\$1.12\frac{1}{2}$ a set; $\frac{3}{8}$ iron,
310 90 cents a set; for $\frac{3}{4}$ iron, $\$1.12\frac{1}{2}$. Those were the prices in 1882 and 1883 that we realized, net. In 1884, 1885, and 1886 the prices were the same exactly, except the half-inch steel, which were 90 cents a set.

Q. And the profits you derived from the sale of these equalizers is represented per set by the difference between the cost as stated by you and the price at which they were sold by you?

A. Yes, sir.

Q. It is in testimony that Mr. Topliff, defendant in this case, has sold large quantities of these equalizers during the period from the year 1882 to the present date. You may state, and give your reasons for your opinion, if you have any, whether, if the defendant had not interfered or made and sold these on the market, your sales

would have been increased by the amount that he has sold or any part of it.

Objected to.

A. Until Mr. Topliff commenced manufacturing in Cleveland, we never knew of any one else putting any upon the market except ourselves; never knew of but one case of any one manufacturing, even for their own use, any. We had advertised them very thoroughly and were known throughout the United States as manufacturers of these goods. We had ample facilities for supplying all demands, and had at all times supplied the demands up to the time he commenced manufacturing, and after he commenced manufacturing our sales were reduced very considerably—by nearly the amount that he manufactured—perhaps more; I have not the figures.

Answer objected to by defendants.

Q. At any time since 1882 or 1883 has anybody been au-
311 thorized in the United States to make these equalizers?

A. Only in one instance. There was one carriage-maker who wished to make a special rod, and he paid us for making ten or twenty sets—less than fifty sets. He paid us for the privilege of making them in his shop.

Q. Was that fact known generally, that these equalizers could not be obtained from anybody but you?

A. We always advertised ourselves as sole manufacturers, and also that we had a patent upon it.

Answer objected to.

Q. As a matter of fact, who else manufactured these things in the United States except yourselves and, during these years, Mr. Topliff, the defendant?

A. No one that I know of, except in the case mentioned.

Q. State in what way the defendant's manufacture and sale of equalizers effected your business as manufacturers and sellers of equalizers?

Objected to.

A. It effected us by drawing trade away from us. He at all times undersold us in price—took some of our trade away.

Q. You say that he undersold you in price during all these years. Have you compared the prices at which he sold equalizers, as is shown in his statements here, and the prices at which you sold them through the same periods? If so, state whether he sold them for less or more in amount and how much.

A. He sold them for from 15 to 25 cents a set less than we have during this period, from his statement.

Q. During the whole period?

312 A. Yes, sir.

Q. What did you do in order to meet this competition that you found existing in the market against you coming from the defendant?

Objected to.

A. We did nothing except in the way of advertising in trying to impress upon our customers the fact that there was a liability in using any other rods but ours, and except to reduce the price of half-inch steel rods at the beginning of 1884. Most of what Mr. Topliff sent out, so far as we could learn, were half-inch steel, and our customers were very much dissatisfied at the price we were charging, namely, $1.12½; so, January 1st, 1884, on account of this competition, we reduced the price from $1.12½ to 90 cents a set. Previous to that time the trade had been willing to pay more for the steel rods and were satisfied with them. After that it was difficult to sell them for any more than the price of the iron ones, but we only reduced them to the price of the iron ones, namely, 90 cents.

(By the MASTER:)

Q. Have you any means of knowing whether any of your regular customers became customers of Mr. Topliff?

A. Yes, sir. All the customers he had that had previously used rods were our customers, because we had been the only source of supply in the United States. I could give the names of very many parties who bought rods of us and afterwards bought of him, some of them in quite large quantities.

(By Mr. SHERMAN:)

Q. You may show what your total sales were in the several years from 1882 to the present time.

Objected to.

313 A. Our sales in 1882 were 9,881 sets; in the year 1883, 7,436; in the year 1884, 5,343; in the year 1885, 3,828.

Q. Will you hand to the master a statement of the sales made by you by months during the years from 1882 to 1886, inclusive?

A. Yes, sir; I will.

(Paper produced and marked "Complainants' Exhibit 1.")

Answer and exhibit objected to.

Q. You may also hand to the master a statement of the cost of manufacturing of the ⅝-inch iron and the half-inch steel rods; also the prices that you received for same during the years 1882 to 1886, inclusive. You may also include in your statement, in the total, the sales made by you in the years 1880 and 1881.

A. It is included in the statement "Complainants' Exhibit 1."

Same objection.

Q. State what your total sales were in 1880.

Objected to.

A. 8,485 sets.

Q. And in 1881.

Objected to.

A. 9,966.

Q. What effect upon your sales did the sale and marketing of defective rods by the defendant Topliff have during the years covered by this investigation?

Objected to.

A. It damaged our sales very materially. In many instances parties ceased to use rods on account of the failure of so many of these malleable iron rods. These rods are not an essential
314 in a buggy; a buggy can be made without them. They are used to equalize the strain on the springs and prevent too great rocking motion; but if a person has one on his buggy and it fails, as the malleable iron ones did, it is a great deal better off his buggy than on. Should any one see these rods on a buggy and see that they were loose he would be very careful not to buy a buggy that had them on, because if a buggy is made strong it is a great deal better without them than with them loose, and many of these working loose on buggies would injure the sale of buggies with them on; so that the effect of putting such a quantity of these malleable iron ones upon the market was to injure the business very materially.

Q. You state that as a fact?

A. That is a fact; yes, sir. Of course we have tried to overcome it all we could and are doing so now, in a measure, and are helped in a measure by Mr. Topliff making a better article and sending it out now.

Q. State what effect the granting of the injunction against the defendant had upon your sales.

Objected to.

A. I can only give it for the first quarter of the year 1886 compared with the first quarter of 1885. In 1885, in the first three months, we sold 942; in 1886 we sold 1,864 sets—nearly double the quantity—in the first three months. It lacks just twenty of being double the quantity.

Q. Please look at "Exhibits A, B, and C," introduced by the defendant, and state what, in principle, is the difference between
315 that kind of a rod and the rod that was made by the defendant before the injunction was obtained against him, and whether that rod is in substance the same rod, and how it differs, if at all.

Objected to.

A. The rod he made before would be identical with this if this was cut off here (indicating), and the length in here added to that there, or, in other words, this rod would run from here right straight through instead of being put in here (indicating). As that part there departs from this point it departs from the principle of our rod. As that point approached this point it approaches to it. When they get here it is identical with our rod. If a carriage-maker should fasten this rod to his buggy by clipping it around there in-

stead of here (indicating) he would have our rod with this useless appendage. He could cut it off or he could leave it there. You can see that the nearer that rod comes to the center of motion here the more perfect the equalization of the springs will be. As you depart from here the less it will act. If that point there could be carried down to this hole you would have no equalization at all. The nearer he brings that to this point the better equalization he gets and the nearer he gets to our patent. It is not for me to say whether that is near enough to make an infringement of our patent or not, but that is all there is of it. As you move from this point you destroy the equalization proportionately, and as you get nearer the point you get nearer our patent; but a carriage-maker can just as well get our exact rod by clipping that around there and fastening it to his buggy and cutting those off, and he could well afford to cut those off for the difference in price.

316 (By the MASTER:)

Q. This manufacture of rods is but one department of your business, is it not?

A. Yes; one department of our business.

Q. You have shown the decrease in this particular department of business in the years named. Was there a corresponding decrease in the other departments of your business in that time?

A. I could not state here. We have a very close competition with Mr. Topliff and are carrying on a close, hard fight. I have not gone into the details of it and don't know, but our other business has not been effected by this business. The two are substantially independent.

(By Judge BOYNTON:)

Q. You mean the bow-socket business?

A. Yes, sir; of course it is a convenience for parties buying bow sockets to buy those together. I guess we have increased every year in the number of bow sockets sold.

Cross-examination by Judge BOYNTON:

Q. Is it not true that you sell a great many more bow sockets than equalizers?

A. Yes, sir.

Q. Hundreds and thousands more, do you not?

A. Yes, sir.

Q. That is, people who use your bow sockets who don't use your equalizers at all?

A. Yes, sir.

Q. A great many of them?

317 A. A great many of them; yes, sir.

Q. Is it not true that your bow socket is popular—that is, it is such a good article that the use of the bow socket has been extending ever since you commenced manufacturing? Has it not increased so far as your manufacture and so far as the defendant's manufacture is concerned during the last six or eight years?

A. Yes, sir.

Q. And pretty largely, has it not, in number?

A. Yes, sir.

Q. Is it not true that fewer of these equalizers are used on carriages than were used ten years ago?

A. No; I won't say ten years ago.

Q. Say eight years ago?

A. No; I won't say eight years ago.

Q. Say six years ago?

A. The first quarter of the year 1886 would indicate that there was very little change between this and six years ago.

Q. Take it from ten years ago down to 1885. Was there not a gradual diminution in the demand or a gradual decrease in the number made?

A. Our sales show that we sold more in the year 1881 than we had sold before unless it was in the year 1879. The business increased up to 1881. It was a new business worked up and it increased up to 1881. The year 1882 fell a very little under 1881, but if you add Mr. Topliff's sales to ours there were more sold in 1882 than there were in 1881 by several thousand. That was the first year we met with competition.

Q. Is it not true that you had in the years when you met competition a very much more extended market? Didn't you and Mr. Topliff reach out to purchasers that before then you had not?

318 A. I cannot state what he did; we did not.

Q. Is it not true that these equalizers are gradually growing into disuse among carriage-makers?

A. No, sir; because if that was so why should we sell twice as many in the first quarter of 1886 as we did in the first quarter of 1885?

Q. Leave that quarter out then. You would not say, had you not had that experience of the first quarter of 1886, that this equalizer was gradually growing into disuse?

A. I would say that it was the injury done the trade by putting out these malleable-iron equalizers which failed.

Q. You attribute it to that exclusively?

A. I do; and to the sales which he got away from us; but if you will add his sales to ours you will find it runs along without any great diminution.

Q. Is it not true that you don't see any of these equalizers on carriages driven along our streets?

A. This is not a very good section for these rods. There are fashions in carriages as in other things. Cincinnati, one of the largest sections for the manufacture of carriages, uses very few equalizers. Take New York, Milwaukee, and Chicago, where there are not nearly as many made, there are more equalizers used than in Cincinnati. Cleveland is not a very good point for equalizers.

Q. Is it not true that during the last three or four years there has been a general depression in business?

A. Yes, sir; there has.

Q. And has not the difficulty been in the manufacturing business?

A. Yes, sir.

319 Q. Would you not, then, ascribe to the decline in manufacturing business and the lessening demand in consequence of the depression of the times—would you not ascribe a portion of the loss, which you allege you have sustained, to that depression?

A. It is impossible for me or any one else to figure that right down to a nicety. My opinion is that it is not so, because I know of so ma-y cases of parties being dissatisfied with rods, having had experience with the malleable-iron ones and having quit using them, and we have got them back and showed them the difference. I had a man at our place at Elyria who wanted to see every kind of rod we made. I showed him our rods. "Well," said he, "you make some others." Says I, "That is all we make." Says he, "You have made others." "No, we never have made any others." Says he, "I bought iron at the stores that was sold to me as your iron, with this head, and had so much trouble with them that I quit using them, and they were sold to me as your rods."

Q. You think the sale of the malleable-iron rods affected the market?

A. I think it killed the sale of the malleable iron and the other, too. If it didn't why are they not made? They can be made a great deal cheaper. If a man can make them for half price why don't he make them and sell them?

Q. You buy your iron, I understand, in Norway. Do you buy it very cheaply?

A. We try to buy it as cheaply as we can; yes, sir.

Q. Do you know whether the defendant buys the same iron?

A. I don't know where he buys his iron.

320 Q. Will you explain to the master how this exhibit (Defendant's "Exhibit A") could be attached to a carriage in its present form?

A. I can give no fuller explination than I did—by cutting that off there and clipping it around there (indicating).

Q. Suppose you did not cut this off?

A. A clip could then be made so that you could attach it there without this. It could be bent down so that that would not hit it.

Q. Did you ever see such a one on a carriage?

A. I never saw any of these (referring to "Exhibit A") on a carriage. I never saw one used.

Q. You don't undertake to express an opinion as to whether this, being so far removed, is an infringement on your patent or not.

A. I don't know as that comes within my jurisdiction, sir.

321 In the Circuit Court of the United States for the Eastern Division of the Northern District of Ohio.

TOPLIFF & ELY
vs.
ISAAC N. TOPLIFF. } Testimony Taken Before A. J. Ricks, Esq., July 9th, 1886.

GEORGE H. ELY, one of the complainants, being recalled, testified as follows:

(By Mr. SHERMAN:)

Q. How did you stamp the equalizing rods sold by you, if at all?
A. They were stamped with the date of the patent on every rod.
Q. Those stamps were affixed before you sent them out?
A. Yes, sir.
Q. State how many one-half-inch steel rods have been made by you since the time that you reduced your price from $1.12 to 90 cents, as you have testified.
A. I can only give it up to the first of April of this year. There were 3,354 sets made.

Cross-examination.

By Judge BOYNTON:

Q. When did you reduce the price to 90 cents?
A. It was about January 1, 1884.
Q. Did you sell any of the equalizers to a man by the name of Porter here in the city?
A. I do not remember the name. I could not say.
Q. Do you say you did not sell any during any of those years for less than 90 cents; did you not sell some to some person here that furnished them to Mr. Topliff, the defendant?
322 A. Not to my knowledge.
Q. Did you not sell some here in the city to somebody for less than 90 cents?
A. At what time?
Q. Any time.
A. Not since the year 1882.
Q. Did you sell some in the year 1882 for less than that?
A. Not since January 1, 1882.
Q. Did you in 1881?
A. That I cannot say. That was before I made out the statement of prices here. That was before Mr. Topliff commenced manufacturing.
Q. Did you not furnish some before that at a price less than 80 cents?
A. We may have done it, but I do not remember. I have no record of prices previous to 1882 before he commenced manufacturing.
Q. Did you not keep a record of them?
A. Yes, sir.
Q. Where is your record?

A. I would have to refer to our books at home for prices. It is my impression that for a year or two our prices were a little lower, but not since the time that this statement is made out and for the time that we make any claim.

Q. Can you furnish us the price that you sold for in the years 1879 and 1880?

A. I could not state positively here; no, sir. I can furnish it.

Q. Is it not true that the competition you had at the time resulted in raising the price instead of lowering it?

A. No, sir.

323 Q. Did you extend and widen out your market for the sale so much as to raise your price in 1882 and 1883?

A. No, sir; if they were sold lower in 1880 or 1881, and I think they may have been, it was from this cause: We were then giving a quantity discount on all our goods, bow sockets and connecting rods, the amount of discount depending upon the quantity sold, and to make those discounts uniform we gave the same discounts on the same number of connecting rods that we did on the bow sockets, and our lowest on bow sockets, of course, would be our lowest discount on connecting rods, and rather than change it for the time we gave it, although we considered it too large a discount to give on the connecting rods.

Q. What discount was that?

A. It is my impression now it was thirty-five off; but at that time or a little before that the price on bow sockets had become so changed and demoralized that our system of discounts was entirely broken, and we adopted new prices on our other goods as well as on bow sockets, and discounts were given independently.

Q. What discounts were given in 1882, 1883, 1884, 1885, and up to April, 1886, on equalizers?

A. I can give you the net prices at which we sold them, with the discount off. I have not the list here.

Q. State the net prices, then.

A. The net prices in 1882 and 1883 on half-inch steel were $1.12½ and on ⅝ iron 90 cents and on ¾ iron $1.12½. Since January 1, 1884, on half-inch steel they were 90 cents, on ⅝ iron 90 cents, and on ¾ iron $1.12½.

324 Q. Those are net prices?

A. Those are net prices. There was a time previous to 1882 when ⅝ and ¾ iron were sold for less than this, or the ⅝ iron anyway, for the reason given.

Q. Where did you state that you bought your iron that you manufactured those of—in Norway?

A. I stated that we bought our iron that we made the links of in Norway—Norway or Sweden, or rather through New York agents.

Q. What quantity did you buy at that time?

A. The last shipment we had included some round iron that we used in the bow sockets. Oh, there was forty tons of it, I think.

Q. What has been the general average of your shipments of that iron from Norway during the years 1882, 1883, 1884, and 1885?

A. I could not state here. I should say from forty to fifty tons.

Q. A year?

A. Yes, sir. We have not ordered at a regular time, and some years there may have been shipments of that quantity come in and other years not.

Q. Do you call that a large shipment or a small one?

A. That is about what we order at a time.

Q. Is it not from the fact that you order it in such large quantities that you are enabled to get it much cheaper?

A. I presume it is; yes, sir.

Q. Is not the price that you get it at there much lower than that at which you can get it in this country?

A. I presume it is.

325 Q. What percentages do you save in your purchases by buying in Norway instead of buying in the United States?

A. This iron is rolled to our *guages* which we sent over there, and we cannot get it in this country unless we have it rerolled, which is an additional expense.

Q. How much?

A. I think rerolled iron would be ten or fifteen dollars a ton more than the original bars, but it varies with different parties.

Q. What would be the difference in the percentage in the iron used by you bought in Norway and the same iron bought in the United States and moulded to fit your use in the United States?

A. From ten to fifteen dollars a ton, I should judge.

Q. That does not give me the percentage.

A. From ten to fifteen per cent.

Q. Is it not more than that?

A. No; I think not.

Q. What do you pay per ton in Norway; or, in other words, what does your Norway iron cost you here?

A. I think the last was a trifle over seventy dollars a ton.

Q. What would it cost you moulded here in the United States?

A. I think the quotations we had at the same time to re-roll for those sizes were either eighty-five or eighty-seven dollars a ton. Understand me, I say a trifle over seventy dollars. It was seventy-one or two, if I remember right.

Q. Was there anything else procured by you from abroad in connection with your manufacturing except your iron?

A. No, sir.

326 Q. Nothing that went *into* your manufacture?

A. No, sir.

Q. I got the name wrong in my inquiry. Did you sell to George Cooper & Co. here in the city in 1881?

A. I presume I did, but I cannot say.

Q. Do you know the prices you sold at?

A. I have no record of prices in 1881, but it is my impression that we had a discount of thirty-five off.

Q. Will you furnish the master from your books a statement of the net prices that you received in 1880 and 1881?

A. Yes, sir.

Q. And particularly those at which you sold to Cooper & Co. in this city?

Q. That would be same as we sold to others. There would be no difference in the same quantity.

Judge BOYNTON: Then furnish that to the master and let it be annexed to your testimony as Exhibit No. 2.

ISAAC N. TOPLIFF, being recalled by complainants, testified as follows:

(By Mr. SHERMAN:)

Q. Look at Defendant's Exhibit No. 2 and state when that exhibit was made out by you. It is entitled "Sale of Equalizers."

A. This was made out some time last year. I do not remember the date; something over a year ago, I should think.

Q. Do you remember about when, with reference to the time the decree was taken?

327 A. It was soon after; right away after.

Q. Right after the decree was taken?

A. Yes, sir; soon after.

Q. It was made out, then, before your invoices were burned?

A. The invoices of steel and iron, etc.?

Q. Yes, sir.

A. I do not know; might have had some of the invoices at that time.

Q. I think you stated that your invoices were burned last Jan'y.

A. I think they were.

Q. You made after the decree was entered in this case, according to the statement in Exhibit No. 3, 291 sets of malleable equalizers. When did you receive the orders for those malleable equalizers?

A. I do not know that I could tell you now.

Q. Did you receive them before the decree was entered?

A. I am not certain, but I think so.

Q. Have you those orders?

A. I think I have.

Q. Will you produce those orders?

A. If I have them; yes, sir.

Cross-examination.

By Judge BOYNTON:

Q. State whether you made any profits on the sales of equalizers during the time that you manufactured and sold them.

A. No, sir; I do not think I made any; no. My books do not show that I did. I am confident that I did not.

Q. Did you buy your iron abroad or did you buy it in this country?

328 A. We bought it in this country. We used mostly steel.

Q. Where was it obtained?

A. Well, of the Cleveland Rolling Mill Company or of Condit, Fuller & Co., iron merchants.

Q. Bought it here in the city?

A. Yes, sir. I bought most of the stock three years ago, when it cost a great deal more than it does now.

Q. State, if you sold at any time for cost or less than cost, why you so sold.

A. Well, I produced so few equalizers that I could not make anything at the prices I sold them at. I advertised to make equalizers to order, and I could not make them up in stock ahead; consequently when I received an order I had to make them up, and I had to keep my help in readiness at all times to get up orders in a reasonable length of time.

Q. Is that the reason why you were unable to make a large quantity at a time?

A. I could only make them as I received the orders, and not more than enough to keep the men a half or a third employed.

Q. You stated in your former testimony, I believe, the amount that you manufactured?

A. Yes, sir; I think the exhibit shows the amount.

Q. And what you obtained for them?

A. Yes, sir. I may say, however, that I hadn't as perfect machinery as I should have had if I had had more to make. A good deal of the work I had to have done out of the factory that I hadn't the machinery to make.

Redirect examination.

329 By Mr. SHERMAN:

Q. You were asked to produce a statement of the cost of the malleable-iron equalizers and the amount of money you received for them. Have you got that statement?

A. That has been sent to the master. There are two more statements here that you called for that you have not had yet (producing two papers).

Q. What I want to know is whether they cost more than you got for them.

A. Well, I do not remember that. The exhibit, if you find it, will tell.

Q. That statement that you sent to the master will show whether they cost you more or less than you sold them for?

A. Yes, sir.

Recross-examination.

By Judge BOYNTON:

Q. State what customers you had.

A. My customers were mostly new ones, and not those that had formerly bought of Topliff & Ely. The greater share of my trade was in Cincinnati, where Topliff & Ely, when I was with them, never sold any equalizers.

Q. Then the trade that you opened was with entirely new customers?

Q. Entirely with new customers—almost entirely.

Q. State whether Topliff & Ely had, up to the time that you manufactured, sold any in Cincinnati that you knew of.

A. I was the travelling man for Topliff & Ely most of the time, and they had never sold any in Cincinnati to speak of.

330 Three-fourths of my trade was in Cincinnati.

By Mr. SHERMAN:

Q. When did you cease selling for Topliff & Ely?

A. I think in 1879 or 1880.

Q. After that time did you know who the customers of Topliff & Ely were?

A. Not after that.

Q. How do you know that those parties that you began selling to in Cincinnati were not customers of Topliff & Ely?

A. Because they had just begun making that kind of wagons with equalizers.

Q. Who were those parties in Cincinnati?

A. The Emerson & Fisher Company, Seehler & Co., and Hiram W. Davis & Co., and that cheaper class of carriage-makers.

Q. When did you begin selling to them?

A. In 1882 or 1883, I think.

Q. And those were the malleable equalizers?

A. The first that I sold?

Q. That you sold to them.

A. Yes, sir.

Q. Exhibit No. 7 purports to give a list of machinery and stock on hand. What do the figures in the right-hand column represent?

A. Dollars.

Q. And why are they put there?

A. It is an inventory. You asked for an inventory of the machinery and things on hand.

Q. That is an inventory of the machinery and tools on

331 hand used for making equalizers?

A. For making equalizers; yes, sir.

Q. And where is this list taken from—from your books?

A. No, sir.

Q. From your inventory of last January?

A. No, sir.

Q. Where did you get those figures?

A. Put them down at what I thought they were worth.

Q. When did you put them down?

A. Soon after it was called for.

Q. These figures are not taken from your inventory of last January, but they are deemed to be the value of this machinery and tools now?

A. Yes, sir; when it was called for.

Q. Have you valued all the machinery and tools used in your manufacturing operations on the same basis that you have given these figures on in this statement?

A. Yes, sir.

Q. Do you remember what the first article, the emery-grinder and counter-shaft, cost?

A. Twenty-five or thirty dollars; somewhere along there.

Q. What did the Bradley hammer and shaft cost?

A. I think it was $450; about that.

Q. You have deducted, then, about sixty or sixty-five per cent.?

A. Yes, sir.

Q. Does that deduction hold good through all your inventory of last January?

A. It would vary. On some machines it would be more
332 than others. Some machines are not worth any more than what they would be worth for old iron.

Q. Is this hammer that sort of a machine?

A. No, sir; it is not.

Q. Then this valuation that you have put on this is a valuation that you have put on since you took your last January inventory?

A. It is what I considered or thought it would bring.

Q. That is your own judgment about the matter?

A. Yes, sir.

(By Judge BOYNTON:)

Q. State whether Exhibit No. 7, in your judgment, states the fair value of the property described in it.

A. Yes, sir; I think it is all that the machinery and stock would bring at the present prices at the present time.

Complainants' Rebuttal.

GEORGE H. ELY, one of the complainants, being recalled in his own behalf, testified in rebuttal as follows:

(By Mr. SHERMAN:)

Q. Are you acquainted with the parties named by Mr. Topliff as customers of his in Cincinnati?

A. I am through correspondence and personally with some of them.

Q. How long have you known them?

A. I have known the firm of Emerson, Fisher & Co. for fifteen years or more; Seehler & Co. for ten years or more, and Hiram W. Davis for, I think, five or six years. He is a more recent party.

Q. Have they been customers of yours during the last five or six years?

333 A. Every one of the parties that he named have been customers of ours from five to fifteen years.

Q. In what respect have they been customers of yours? What kind of goods have they bought of you?

A. They have bought bow sockets, bows and all. One of the firms has bought connecting rods, and I do not know but all. I would not say positively that all had. The firm of Emerson, Fisher & Co.

had bought connecting rods of us in the seventies; also Sechler & Co.

Q. Have you any reason to believe those parties would have bought of you unless they could have bought cheaper elsewhere?

Objected to.

A. They had bought those rods of us and were satisfied with the rods, and we know of no reason why they should not have continued to have bought them unless it would have been that they could have bought them cheaper elsewhere. Some of them have come back to us within the last two or three years and have bought quite largely because they liked our rods better.

No cross-examination.

Adjourned to meet at a time to be agreed upon.

554 EXHIBITS B. Being Sundry Exhibits Offered in Connection with the Testimony of Isaac Topliff, Defendant. A. J. Rocks, Spl. Master.

6.

Cost of Equalizers.

1895.

Dec. 1 90-lb hammer & shaft, &c 680 25
1 do. do. for same 55 25
Furnace, setting, &c 75
1 # 1 vise, 3 corner & cam, shaft 38 00
1 # 0 vise, vise 6 25
Setting 9 15
30 250 lbs. " Jess. steel ..... @ 53 1 657 00
7 lbs. 1 " steel ..... @ 05 1 01
Punch rods & dies 15 85

1896.

Jan'y. 1 60 lb. 1 " steel 53 12 18
Wood cuts, steel, &c. (equal) 13 50
1 504 lb. 1 " steel ..... @ 53 18 18
Feb'y. 1 672 lb. 1 " 3 18
1 178 " ..... @ 6 1 06
1 14 1/2 lb. 30 1/2 " piano wire 30 10 10
1 200 lb. 1 " steel 53 70 15
Sig. to same, 1 " 1 50
1 120 lbs. 1 " steel 9 09 60
March 1 2595 — clips, 22 lbs. punch, &c 10 2 50
1 do. 13 " 1 25
1 do. 79 " 9
April. 20 1 618 lb. 1 " steel ..... @ 12 07
May. 1 465 lb clips 35 07
2 620 " 1 " steel 47 65
1 650 lb clips 50 32 50
1 # 30 B. hammer helve & head 14 10
June. Wages, man & helper, 8 mos 403 60

1884.				
July.	114 lb ¼ r'd steel	6	3	3 42
	2,003 lb ⅝ r'd iron			36 32
Aug.	517 lb " " "	185		9 56
	955 lb ⅝ " " "			4 31
Sept'r.	1 set 10 lb H. cushions			11 41
Oct'r.	280 lb ⅝" r'd iron	170		4 79
Nov.	Twine			2 26
	505 lb ⅝ r'd iron	180		9 09
	350			6 30
Dec.	1,320 " " "			23 87
	Wages, 6 mos. man & helper			129 77
1885.				
Jan'y.	Emery wheel			8 50
Feb'y.	125 lb ⅝ r'd iron	160		2
Mch.	500 ⅝ " " "	170		8 50
	W. J. & Co. labor on equal			3 24
385		# 7		
1885.				3,358 83
Mch.	717 lb ⅝ r'd iron	180		12 91
	605	175		10 55
Apr.	25 0, 1" Vlg. B'r			6 75
	241 lb ⅝ r'd iron	170		4 10
	1,021	175		17 86
	1,067			18 67
May.	Wages, man & helper			243 45
	Cost of selling, advertising, office exp. &c., 10 ⅞			340 34
	Cost of power & fuel for furnace, boilers, 10 ⅞			340 34
	Depreciation, interest and proceeds lost by failures, 5			
1885.				
Feb'y.	20 cut 1 x ¼	80	75	15
Mch.	25 " 1 x ¼		85	21 25
Apr.	5 " 1 x ¼			1 25
	1 " 1 x ¼			7 65
May.	1 " 1 x ¼ (2.00)			4 80
June.	100 " 1 x ¼		75	75
	50 " 1 x ¼		70	35
1887.				
	100 " 1 x ¼		75	75
Feb.	50 " 1 x ¼		65	32 50
Apr.	50 " 1 x ¼		75	37 50
				4,703 90

Recapitulation.

Cost of manufacturing	4,703 90
Proceeds of sales	3,363 45
Loss	1,340 45

1884.

Feby	11	6	sets	1 x 1¼	@	.85		5	10
"		20	"	1 x 1¼	"	"		17	
"		9	"	1 x 1¼	"	.75			
"		6	"	1 x 1¼	"	"		6	75
"	12	3	"	1 x 1¼	"	.75			
"		5	"	1 x 1¼	"	.85		4	80
"		1	"	1 x 1¼	"	"			85
"		6	"	1 x 1¼	"	.75		4	50
"		5	"	1 x 1¼	"	"		3	75
"	16	6	"	1 x 1¼	"	"		4	50
"		80	"	1 x 1¼	"	.85			
"		50	"	1 x 1¼	"	.75		71	50
"	18	8	"	1 x 1¼	"	.85		6	80
"	19	3	"	1 x 1¼	"	.75			
"		3	"	1 x 1¼	"	.85		4	80
"		4	"	1 x 1¼	"	.85			
"		5	"	1 x 1¼	"	"			
"		10	"	1 x 1¼	"	"		20	40
"		7	"	1 x 1¼	"	"			
"		2	"	1 x 1¼	"	.75		1	50
"	20	24	"	1 x 1¼	"	"		18	
"		25	"	1 x 1¼	"	.85		21	25
"	21	6	"	1 x 1¼	"	.75		4	50
"		35	"	1 x 1¼	"	"			
"		25	"	1 x 1¼	"	"		47	50
"		12	"	1 x 1¼	"	"		9	
Mch	4	1	"	1 x 1¼	"	.85			85
"		10	"	1 x 1¼	"	.75			
"		6	"	1 x 1¼	"	.85		12	60
"		22	"	1 x 1¼	"	"			
"	5	15	"	1 x 1¼	"	.75		21	25
"		5	"	1 x 1¼	"	"		15	
"		10	"	1 x 1¼	"	"			
"		6	"	1 x 1¼	"	"		7	50
"		2	"	1 x 1¼	"	.85		1	50
"	12	25	"	1 x 1¼	"	"		21	25
"		60	"	1 x 1¼	"	"		111	75
"	13	10	"	1 x 1¼	"	.75			
"	14	80	"	1 x 1¼	"	"		7	50
"		75	"	1 x 1¼	"	"		67	50
"	18	25	"	1 x 1¼	"	.85		56	25
"	24	2	"	1 x 1¼	"	.75		21	25
337								1	50

1884.

Mch	27	2	"	1 x 1¼	@	.75		594	20
"	28	2	"	1 x 1¼	"	.85		2	25
"		75	"	1 x 1¼	"	"		1	25
"	29	10	"	1 x 1¼	"	"		93	75
								8	50

1884

Apr.	1	1	set	⅛ x 1½	66	.75			
"	"	1	"	⅛ x 1½	"	.85		1	60
"	"	10	"	⅛ x 1½	"	.75			
"	"	15	"	⅛ x 1½	"	.85		20	25
"	"	20	"	⅛ x 1½	"	"			
"	"	15	"	⅛ x 1½	"	"			
"	"	5	"	⅛ x 1½	"	"		34	
"	3	10	"	⅛ x 1½	"	.85		8	50
"	8	90	"	⅛ x 1½	"	"			
"	"	50	"	⅛ x 1½	"	"		119	
"	14	100	"	⅛ x 1½	"	"		85	
"	16	10	"	⅛ x 1½	"	.75			
"	"	10	"	⅛ x 1½	"	"			
"	"	15	"	⅛ x 1½	"	"		33	75
"	"	10	"	⅛ x 1½	"	"			
"	21	1	"	⅛ x 1½	"	"			75
"	"	6	"	⅛ x 1½	"	.85		5	10
"	24	25	"	⅛ x 1½	"	.75			
"	"	25	"	⅛ x 1½	"	.85		40	
"	30	20	"	⅛ x 1½	"	.75		15	
May	6	5	"	⅛ x 1½	"	.85		4	25
"	10	20	"	⅛ x 1½	"	"		17	
"	12	80	"	⅛ x 1½	"	"		68	
"	13	10	"	⅛ x 1½	"	.75			
"	"	10	"	⅛ x 1½	"	"		15	
"	15	72	"	⅛ x 1½	"	.85		61	20
"	"	10	"	⅛ x 1½	"	"			
"	"	2	"	⅛ x 1½	"	"		11	40
"	22	75	"	⅛ x 1½	"	.75		56	25
"	"	56	"	⅛ x 1½	"	.85		47	60
"	"	25	"	⅛ x 1½	"	"		21	25
"	"	25	"	⅛ x 1½	"	.95		23	75
"	"	5	"	⅛ x 1½	"	"		4	75
"	23	6	"	⅛ x 1½	"	.75		4	50
"	28	50	"	⅛ x 1½	"	"		37	50
"	"	6	"	⅛ x 2	"	.95		5	70
"	"	24	"	⅛ x 1½	"	.85		20	40

338

1884

								1,434	45
May	28	12	"	⅛ x 1½	66	.75			
"	"	12	"	⅛ x 1½	"	"		18	
June	5	10	"	⅛ x 1½	"	.85		8	50
"	6	50	"	⅛ x 1½	"	"		42	50
"	7	1	"	1½	"	"		1	
"	17	8	"	⅛ x 1½	"	.85		6	80
"	"	4	"	⅛ x 1½	"	.75		3	
"	18	70	"	⅛ x 1½	"	"			
"	"	30	"	⅛ x 1½	"	"		75	
"	25	10	"	⅛ x 1½	"	.75		7	50

1884.								
June	26.	10	set-	$\frac{1}{2}$ x $1\frac{1}{4}$	@	.65		6 50
July	1.	4	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	.75		3
	"	10	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"	"		7 50
	2.	50	"	$\frac{5}{8}$ x $1\frac{1}{4}$	"	"		37 50
	8.	6	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		4 50
	"	2	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		1 50
	10.	6	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		4 50
	16.	6	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	.85		5 10
	19.	50	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"	.65		32 50
	21.	10	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"	"		6 50
	23.	2	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	.75		1 50
	"	2	"	$\frac{5}{8}$ x $1\frac{3}{4}$	"	"		1 50
	26.	25	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		18 75
	"	25	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		18 75
	"	20	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		15
	29.	6	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		4 50
	30.	12	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		9
	31.	1	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"			65
	"	75	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	.75	}	112 50
	"	75	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"	}	
Aug.	6.	50	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		37 50
	"	5	"	$\frac{5}{8}$ x $1\frac{1}{4}$	"	"		3 75
	"	8	"	$\frac{5}{8}$ x $1\frac{1}{4}$	"	"		6
	15.	50	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		37 50
	"	6	"	$\frac{5}{8}$ x $1\frac{1}{4}$	"	"		4 50
	29.	75	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		56 25
	"	50	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	"		37 50
	30.	10	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"	.65		6 50
	"	100	"	$\frac{5}{8}$ x $1\frac{3}{4}$	"	.75		75
	"	50	"	$\frac{9}{16}$ x $1\frac{1}{2}$	"	.70		35
	"	25	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	.75		18 75
339								2,106 25
1884.								
Sept.	1.	2	"	$\frac{1}{2}$ x $1\frac{1}{2}$	@	.65		1 30
	"	2	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	.75		1 50
	"	2	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		1 50
	6.	6	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	.65		
	"	2	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	"		6 50
	"	2	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"	"		
Oct.	7.	6	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	"		3 95
	"	10	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		6 50
	"	5	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	.85		4 25
	15	"	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		12 75
Nov.	19.	1	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"			65
	22.	102	"	$\frac{5}{8}$ x $1\frac{1}{2}$	"	.75		75
	26.	50	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		37 50
Dec.	4.	6	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	.65		3 90
	13.	12	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		
		4	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"	"	}	10 40

1884.								
Dec.	20.	1	set	$\frac{1}{2}$ x $1\frac{1}{4}$	@	.65		75
	"	26	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"	.75		19 50
1885.								
Jan'y	20.	1	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"			65
	23.	10	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"			7 50
	27.	25	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	.65		16 25
	"	25	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"	.75		18 75
	"	10	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"	"		7 50
	"	10	"	$\frac{7}{8}$ x 2	"	"		7 50
	"	15	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"	.65		9 75
	"	5	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	"		
	"	5	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		6 50
	30.	89	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	.75		66 75
Feb'y	4.	6	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	.65		3 90
	"	6	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"	.75		4 50
	5.	12	"	$1\frac{1}{4}$ x $1\frac{1}{2}$	"	.65		
		12	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"			15 60
	10.	17	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	.65		
	"	10	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	"		
	"	10	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"	"		24 05
	14.	20	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		13
	17.	3	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	"		1 95
	21.	12	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	.85		10 20
	24.	50	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	.65		32 50
M'ch	2.	5	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"	.75		3 75
	"	15	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	.65		9 75
340								
								2,552 50
1885.								
M'ch	6.	50	"	$\frac{7}{8}$ x $1\frac{1}{2}$	@	.75c.		37 50
	"	50	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"			37 50
	11.	50	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"			37 50
	"	100	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"	.75		75
	"	50	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	.65		32 50
	12.	100	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"	.75		75
	"	50	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"	"		37 50
	"	50	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"	"		37 50
	"	5	"	$\frac{7}{8}$ x $1\frac{1}{4}$	"	"		3 75
	"	5	"	$\frac{7}{8}$ x $1\frac{1}{4}$	"	"		3 75
	13.	50	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"	.70		35
	"	50	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	.65		32 50
	16.	$\frac{1}{4}$	"	$\frac{7}{8}$ x $1\frac{1}{2}$				20
	20.	$\frac{1}{2}$	"	$\frac{1}{2}$ x $1\frac{1}{2}$				30
	24.	10	"	$\frac{1}{2}$ x $1\frac{1}{4}$	"	.65		
		8	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	"		
		6	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		15 60
	24.	20	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		13
	25.	$\frac{1}{2}$	"	$\frac{1}{2}$ x $1\frac{1}{2}$	"	"		35
	26.	25	"	$\frac{1}{2}$ x $1\frac{3}{8}$	"	"		16 25
	"	10	"	$\frac{7}{8}$ x $1\frac{1}{2}$	"	.75		7 50

1885.

M'ch	26.	10	set-	$\frac{5}{8}$ x $1\frac{1}{2}$ @ .75		7 50
	31.	8	"	$\frac{1}{2}$ x $1\frac{1}{4}$ .65		5 20
		4	"	$\frac{1}{2}$ x $1\frac{3}{8}$ "		2 60
Apr.	1.	1	"	$\frac{5}{8}$ x $1\frac{1}{2}$ "		75
	4.	3	"	$\frac{1}{2}$ x $1\frac{1}{4}$		1 95
	"	12	"	$\frac{5}{8}$ x $1\frac{1}{2}$ .75		9
	7.	50	"	$\frac{5}{8}$ x $1\frac{1}{2}$ "		37 50
	"	40	"	$\frac{5}{8}$ x $1\frac{1}{2}$ "		30
	"	20	"	$\frac{5}{8}$ x $1\frac{7}{8}$		15 00
	16.	6	"	$\frac{5}{8}$ x $1\frac{1}{2}$ .75		4 50
	20.	50	"	$\frac{5}{8}$ x $1\frac{3}{8}$		37 50
	"	50	"	$\frac{1}{2}$ x $1\frac{1}{4}$ .65		32 50
	21.	25	"	$\frac{5}{8}$ x $1\frac{1}{2}$ "		16 25
	28.	100	"	$\frac{5}{8}$ x $1\frac{1}{2}$ .75		75
		50	"	$\frac{5}{8}$ x $1\frac{1}{2}$ "		37 50
						3,363 45

341 EXHIBIT 3.

Sold the first malleable or "Saladee" patent equalizers April 8th, 1882.

No. sets malleable equalizers sold in					1882	2,462
"	"	"	"	"	1883	5,088
"	"	"	"	"	1884	1,250
"	"	"	"	"	1885	530
"	"	"	"	"	1886	115
"	"	"	"	"	since April 28th, 1885	291

No. sets of wrought equalizers, new style, "Stringfellow's" patent, made since April 28th, 1885 611

342 EXHIBIT 4.

Cost of machinery & tools	25,861
Inventory of same Jan. 1st, 1886	13,315 03

EXHIBIT 5.

Steel Bo't for Equalizers.

March 2d, 1882	22,083 lb
Jan'y 25th, 1883	34,270 lb
June 12th, "	1,000 lb
July 20th, "	440 lb
August 6th, "	596 lb
Sept. 6th, "	1,061 lb
" 8th, "	1,080 lb
October 8th, "	1,177 lb
" 31st, "	1,124 lb

Exhibit 6.

Sales of Equalizers from April 1st, 1885.

1885.

Ap'l	30.	50 sets	⅝ x 1½	at .75		37	50
	"	30 "	⅝ x 1¾	" "		22	50
	"	50 "	⅝ x 1½	" "		37	50
May	6.	75 "	⅝ x 1½	" "		56	25
June	13.	10 "	½ x 1¼	" .65		6	50
		15 "	½ x 1⅜	" "		9	75
		10 "	½ x 1½	" "		6	50
July	2.	25 "	⅝ x 1½	" .75		18	75
Aug.	10.	87 "	⅝ x 1½	" "		65	25
	12.	50 "	⅝ x 1½	" "		37	50
	"	25 "	⅝ x 1½	" "		18	75
	18.	100 "	⅝ x 1½	" "		75	
	21.	50 "	⅝ x 1½	" "		37	50
	21.	50 "	⅝ x 1½	" "		37	50
Sept.	19.	50 "	⅝ x 1½	" "		37	50

343 *List of Machinery and Stock on Hand.*

1 emery grinder & counter-shaft	15	
1 Bradley hammer and shaft	175	
1 furnace	20	
1 lot of belting, old	3	
346 set- of equalizers, finished and part finished, at 7c.	24	22
7,300 lb of ½" round steel, at 2c.	146	
	383	22

Exhibit 7, A. H.

Cost of Equalizers Made Since April 1st, 1885.

677 set- at 8 lb to the set, 5,416 lb steel, at 2c.	108	32
812 lb of steel cuttings for same, @ 9c.	73	08
1 emery wheel used upon same	10	25
Cost of labor on 677 set-, at 20c. per set	135	40
Cost of selling, &c., 10 % on $504.00	50	40
Cost of power, fuel for furnaces, tools, &c., 10 %	50	40
	427	85

Exhibit 8, A. H.

344 And afterward, to wit, on the 30th day of Oct., 1886, there was filed in this court exceptions to the master's report, which *is* in the words and figures following, to wit:

In the United States Circuit Court *Court* for the Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF and GEORGE ELY, Plaintiffs,
vs.
ISAAC N. TOPLIFF, Def't.
} Exceptions to Master's Report.

Now comes the respondent, Isaac N. Topliff, and excepts to the report of A. J. Ricks, master in said case, for the following reasons and in the following particulars:

1st. The damages reported as having been sustained by the complainant*d* through the alleged infringement of letters patent by said respondent are excessive and exorbitant, and the finding is wholly unsupported by the testimony.

2nd. The testimony wholly fails to show that damages exceeding $1,000 were sustained by said complainants through the alleged infringement.

3rd. There was no testimony before said master tending to show that complainants would have sold any of said equalizers to one-fifth of the persons to whom said respondents sold those by him manufactured.

4th. The profits found to have been made by said com-
345 plainants on the sale per set of said equalizers is contrary to the test*u*mony.

5th. The said master received and gave effect to incompetent testimony, as shown in the report of the testimony.

6th. The finding that said complainant- would have sold seventy-five per cent. of the equalizers sold by said respondent has no proof to support it.

7th. There was no evidence showing that any damages resulted to the complainants by the making a sale of a device involving the patented fea*u*ture of the complainants' patent, and the opinion of the master that that patented feature gave the device its value as a whole is not founded on any evidence submitted to him.

8th. The master erred in finding that complainants commenced the manufacture of equalizers about 1880 and in founding his judgment in part on that fact, because the testimony shows that they commenced as early as 1870 and continued the same down to the time of said hearing.

BOYNTON AND HALE,
Solicitors for Respondent.

346 And afterward, to wit, on the 2nd day of November, 1886, the following, endorsed complainants' exceptions to master's report, was filed, and which is in the words and figures following, to wit:

Circuit Court of the United States, Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF and GEORGE A. ELY, Partners under the Firm Name of Topliff & Ely, Complainants,
vs.
ISAAC N. TOPLIFF, Defendant.
} Exceptions to Master's Report.

And now come the above-named complainants and file these their exceptions to the report and findings of A. J. Ricks, Esq. (the special master to whom this case was heretofore by an order of this court referred), filed herein on the 11th day of October, 1886:

1st exception. For that the said special master in his said report failed to find any damages by reason of the manufacture and sale by defendant of the 611 sets of wrought-iron equalizers, "new style, Stringfellow patent" (so called), since April 28th, 1885, as shown by said defendant in his Exhibit Number 3 filed with said report, whereas the said master should have reported the sum of $410.90 as damages sustained by the complainants by reason of such
347 manufacture and sale by the defendant of said 611 sets of equalizers.

2nd exception. For that the said special master refused to allow and report any damages sustained by the complainants on 3,354 sets of their equalizers which they were compelled to sell at reduced prices after January 1st, 1884, by reason of the said defendant's competing infringement, whereas the said special master should have reported the sum of $754.65 (the said enforced reduction being 22½ cents on each of said 3,354 sets so sold) as damages sustained by these complainants because of such enforced reduction of prices.

JOHN A. TOPLIFF AND GEORGE H. ELY,
Complainants,
By SHERMAN AND HOYT, *Their Solicitors.*

H. S. SHERMAN, *Of Counsel.*

348 And afterward, to wit, on the 2nd day of November, the following motion was filed, and which is in the words and figures following, to wit:

Circuit Court of the United States, Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF and GEORGE H. ELY, Partners under the Firm Name of Topliff & Ely, Complainants,
vs.
ISAAC N. TOPLIFF, Defendant.
} Motion for Order to Show Cause.

Now come the above-named complainants and filed this their motion for an order requiring the said defendant, Isaac N. Topliff, to show cause why an order of attachment should not be issued

against him for violating the injunction heretofore allowed against him in the above-entitled cause restraining him from the manufacture and sale of the invention described in the letters patent mentioned in the bill filed herein.

And in support of this motion the complainants pray that the testimony taken and the exhibits offered before the master, to whom this cause was referred to report profits and damages, may be used, so far as the same is relevent, in addition to such affidavits and other proofs that may be offered by these complainants on the hearing of this motion.

JOHN A. TOPLIFF & GEORGE H. ELY,
By SHERMAN AND HOYT, *Their Solicitors.*

H. S. SHERMAN, *Of Counsel.*

349 And afterward, to wit, on the 2nd day of February, the following entry of appearance was filed, and which is in the words and figures following, to wit:

CLEVELAND, O., 2 *Feb.*, 1887.

Clerk U. S. circuit court, Cleveland, O.:

Please enter my name as associate counsel for the defendant in Topliff & Ely *vs.* I. N. Topliff.

Very respectfully, &c., M. D. LEGGETT.

350 And afterwards, to wit, on April 9th, 1887, the following order was entered in this cause, and which is in the words and figures following, to wit:

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF. } 4289. Chancery.

This cause came on to be heard upon the exceptions of complainants and respondent to the master's report, and the same was argued by counsel and taken under advisement.

351 And afterward, to wit, on the 19th day of April, 1887, the following order was made in this cause, and which is in the words and figures following, to wit:

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF. } 4289. Chancery.

This day this cause came on to be heard upon the motion, exhibits, and testimony filed by complainants herein for an order upon said defendant, Isaac N. Topliff, to show cause why an attachment should not be issued against him for violation of the injunction heretofore allowed in this cause, and was argued by counsel; and upon consideration thereof the court orders said motion to be, and the same is hereby, sustained.

It is therefore ordered that the said defendant, Isaac N. Topliff,

show cause on or before the 15th day of May, 1887, why an order of attachment should not be issued against him for the alleged violations of said injunction heretofore allowed in this cause.

And it is further ordered that, pending the foregoing attachment proceedings, the said defendant, Isaac N. Topliff, his agents, attorneys, workmen, and servants, each and all of them, be, and the same are hereby, restrained from directly or indirectly making, constructing, using, vending, delivering, continuing, or putting into practice, operation, or use any of the devices shown respectively in the Defendant's Exhibits A, B, and C, mentioned in and now on file with the master's report in this cause.

352 And afterward, to wit, on the 19th day of April, 1887, the following order was entered in this cause, and which is in the words and figures following, to wit:

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF. } No. 4289. Chancery.

This day this cause came on to be heard upon the master's report and the defendant's exceptions thereto, heretofore filed herein, and was argued by counsel, and the court being fully advised in the premises, and it appearing to the court that said master erred in his findings as to the amount of damages in the case—

It is therefore ordered that said cause be, and the same is, again referred to said master, A. J. Ricks, Esq., on account of his experience in such matters of accounting, who is hereby directed to take a new account and report his findings to this court as soon as may be convenient, according to the order of reference to him heretofore entered in this cause, and leave is hereby granted to the complainants to offer further and additional testimony before said master.

353 And afterward, to wit, on the 25th day of May, 1887, the following restraining order was issued, and which is in the words and figures following, to wit:

THE UNITED STATES OF AMERICA, } ss:
Northern District of Ohio, Eastern Division,

At a stated term of the circuit court of the United States within and for the eastern division of the northern district of Ohio begun and held at the city of Cleveland, in said district, on the first Tuesday in April, being the fifth day of said month, in the year of our Lord one thousand eight hundred and eighty-seven, and of the Independence of the United States of America the one hundred and eleventh—present, the Honorable Martin Welker, district judge—among the proceedings then and there had were the following, to wit:

TUESDAY, *April 19th.*

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF. } Chancery. No. 4289.

This day this cause came on to be heard upon the motion, exhibits, and testimony filed by the complainants herein *and* for an order upon said defendant, Isaac N. Topliff, to show cause why an attachment should not be issued against him for violation of the injunction heretofore allowed in this cause, and was argued by
354 counsel; and upon consideration thereof the court orders said motion to be, and the same is hereby, sustained.

It is therefore ordered that the said defendant, Isaac N. Topliff, show cause on or before the 15th day of May, 1887, why an order of attachment should not be issued against him for the alleged violations of said injunction heretofore allowed in this cause.

And it is further ordered that, pending the foregoing attachment proceedings, the said defendant, Isaac N. Topliff, his agents, attorneys, workmen, and servants, each and all of them, be, and the same are hereby, restrained from directly or indirectly making, constructing, using, vending, delivering, continuing, or putting into practice, operation, or use any of the devices shown respectively in the Defendant's Exhibits A, B, and C, mentioned in and now on file with the master's report in this cause.

THE UNITED STATES OF AMERICA,
Northern District of Ohio, Eastern Division, } *ss:*

I, Augustus J. Ricks, clerk of the circuit court of the United States within and for said district, do hereby certify that the within is a true copy of order entered upon the journal or the proceedings of said court in the therein-entitled cause; that I have compared the same with the original entry of said order, and it is a true transcript therefrom and of the whole thereof.

Witness my official signature and the seal of said court, at Cleveland, in said district, this 25th day of May, A. D.
355 [SEAL.] 1887, and in the 111th year of the Independence of the United States of America.

[SEAL.] AUGUSTUS J. RICKS, *Clerk,*
By O. C. BEATTY, *Deputy Clerk.*

NORTHERN DISTRICT OF OHIO, *ss:*

On the 26th day of May, 1887, at Cleveland, Ohio, I made due service of the within order by delivering a true and duly certified copy thereof to the within-named Isaac N. Topliff.

W. F. GOODSPEED,
U. S. Marshal,
By GEO. WYMAN, *Deputy.*

Service	$2 00
Travel	50
	$2 50

Endorsed: Filed May 28th, 1887. A. J. Ricks, clerk.

356 And afterwards, to wit, on the 27th day of May, 1887, the following notice of motion was filed in this cause, and which is in the words and figures following, to wit:

In the Circuit Court of the United States for the Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF & GEORGE H. ELY
vs.
ISAAC N. TOPLIFF. } Notice.

The plaintiffs are hereby notified that on Monday, May 30th, the defendant will apply to the Hon. Martin Welker, one of the judges of said court, for an order suspending the operation of the restraining order heretofore granted in said case to the extent necessary to allow the defendant to fill such orders for equalizers as he may now have on hand, and that said application will be made at the residence of said judge, Wooster, Ohio, at 10 o'clock of said day.

BOYNTON & HALE,
Attorneys for I. N. Topliff.

I accept service of this notice this 27th day of May, 1887.

H. S. SHERMAN,
Attorney for Complainants.

357 And afterward, to wit, on the 27th day of May, 1887, the following motion was filed, and which is in the words and figures following, to wit:

In the Circuit Court of the United States for the Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF & GEORGE H. ELY, Partners, &c.,
vs.
ISAAC N. TOPLIFF. } Motion.

The defendant now comes and moves the court to suspend the order heretofore issued in said case restraining him from manufacturing and selling equalizers recently by him manufactured to the extent necessary to enable him to fill present outstanding orders for the same on condition that he keep an accurate account of the kind and value of the equalizers so required to fill said orders, and in support of said motion the defendants says that he was advised by patents experts and lawyers that the equalizer which he is now temporarily enjoined from selling in no ways infringes the patent of said plaintiffs, and that he relied in good faith upon said advice, believing that their manufacture and sale were in no respect an infringement of the letters patent belonging to th- plaintiff-.

He further says that carriage-makers who have given him the orders for said equalizers have been assured that they would

be shipped within a few days and are now awaiting their
358 arrival to complete the construction of carriages now in process of construction.

The defendant says that he will keep an accurate account of all the equalizers shipped to fill pending orders and report them to the court and account for the same in the event that it is determined that he is required so to do by reason of their being an infringement upon the patent of said plaintiffs.

BOYNTON AND HALE,
Attorneys for said Defendant.

359 And afterward, to -it, on the 31st day of May, 1887, the following order was entered on the order book of this court in this cause, and which is in the words and figures following, to wit:

JOHN A. TOPLIFF and GEORGE H. ELY, Partners, &c., } Chancery.
vs. } 4289.
ISAAC N. TOPLIFF. }

The restraining order heretofore issued in said case to the extent prayed for in the motion filed May 27th, 1887, is hereby suspended, the said defendant keeping and returning an accurate statement of number of equalizers shipped under this permission, and upon the respondent giving bond in the sum of one thousand dollars that he will pay the complainants any decree they may recover for the damages sustained by such filling the orders named in the motion in case it be finally determined an infringement.

This order to continue until further order herein.

Done at chambers, at Wooster, this 30th day of May, A. D. 1887.

(Signed) M. WELKER,
Dist. Judge U. S., said District.

360 And afterward, to wit, on the 1st day of June, 1887, a bond was filed in this cause, which is in the words and figures following, to wit:

Know all men by these presents that we, Isaac N. Topliff, as principal, and John C. Hale, as surety, are held and firmly bound unto John A. Topliff and George H. Ely in the sum of one thousand dollars, to the payment whereof *he* bind ourselves, our heirs, executors, and administrators, firmly by these presents.

The condition of this obligation is such that whereas by the terms of a decree of the United States circuit court for the northern district of Ohio the said Isaac N. Topliff was enjoined from manufacturing and selling a certain equalizing rod for buggy springs, and the said restraining order was afterwards so far modified as to allow the said Isaac N. Topliff to fill present outstanding orders at the date of the entry of said modification, to wit, May 30th, 1887:

Now, if the conditions of said order are in all things complied

with, then this obligation to be void, but otherwise to be and remain in full force and effect.

ISAAC N. TOPLIFF.
JOHN C. HALE.

361 And afterward, to wit, on the 30th day of March, 1888, the following report of master was filed in this cause, and which said report is in the words and figures following, to wit:

In the Circuit Court of the United States, Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF and GEORGE H. ELY
vs.
ISAAC N. TOPLIFF. } Equity. No. 4289.

To the honorable the judges of the circuit court:

At the April term, 1887, this cause came on to be heard upon exceptions to the report of the undersigned, as special master, theretofore filed, and after argument and due consideration the court ordered that the case be again referred to the master "to take a new account and report his findings to the court as soon as may be, according to the order of reference heretofore entered in this cause, and leave is hereby granted to the complainants to offer further and additional testimony before said master."

The former order of reference above referred to required the master "to take an account of all the gains and profits which have accrued to the said defendant, Isaac N. Topliff, from the manufacture, use, and sale of the inventions and improvements, or
362 any part of them, described in said letters patent and reissued letters patent respectively, and also to take an account of all the damages suffered by the complainants by reason of such unlawful acts of the said defendant in his infringement of said letters patent and reissued letters patent respectively," &c.

The master has heard such additional testimony as the parties produced and, having duly considered the same in connection with that before offered, submits his report, as follows:

The complainants and defendant were formerly associated in business in the same general line of trade which they afterwards separately pursued when the matters now in dispute arose between them. Defendant was the traveling sales agent for the complainants. While so associated in the manufacture of carriage hardware and appliances they established a large trade in certain parts of the country, where the particular product now in contention was sold and used. During this period the defendant, while traveling for the firm and making sales for them of the said product, became fully aware of the character of their trade and of the location, extent of purchase, and solvency of their joint customers. The business connection terminated and the defendant came to Cleveland and began a rival establishment. Among the other products of his manufacture was the equalizer which the decree of the court adjudged to be an in-

fringement of the complainants' patent. The testimony shows that this infringement and sales of the infringed article began in 1882.

Before that time the complainants were the exclusive manufacturers of these equalizers. They owned the patents
363 covering the product and equipped their establishment with sufficient machinery to enable them to supply the market with their invention, and they neither issued licenses nor established a royalty for the manufacture or use of their improvement. As soon as they began the manufacture of their patented article it was at once accepted by the public as a useful and valuable improvement. Its sale was extensive and very profitable. It was in the line of their other manufactured productions and increased the value of their other business. When the defendant established his rival business in Cleveland, as before stated, he began making and selling the infringed article, believing, as he says in his testimony, that its manufacture would enable him to better sell his other products. He embarked in this enterprise with full knowledge of complainants' patents—of their facilities for the cheap, rapid, and profitable manufacture of these equalizers—of their mode of doing business and how to reach their customers. His infringement was, therefore, not accidental or in ignorance of complainants' claims and rights. He must have calculated the risks and knowingly assumed the responsibilities attending his venture.

The testimony shows that the defendant, though manufacturing largely, realized no profits on the making and sales of the infringed article. The complainants, therefore, cannot be awarded any sum on that account.

The only question, therefore, left to be determined is the amount of damages the complainants have sustained because of defendant's infringement.

364 In my former report I referred to the claim of the defendant that all the damages for which he is liable is for the value of the use of only that particular part of the equalizer which he contends has been held to be an infringement. Complainants contend that their patents cover the method of equalizing springs by means of the combination of rod and clips described in the patents. The rod and the clips are the only elements which compose the whole device, and the entire device is claimed by the patents. Even conceding the defendant's theory that the patents cover only a part of the device, I think the rule is well settled that, in order to mitigate damages, the burden is on the defendant to show that some other equally useful and acceptable device was open to him and the public which he was entitled to use, or that the parts of the device covered by the complainants' patent did not contribute to the value of the invention as an entirety, and that therefore the damages should be nominal, or at least he should show to what extent they should be reduced. This the defendant has not done. The weight of the evidence shows that each feature and part of the device is essential to the whole, and that the defendant has used the invention in its entirety in his infringing product.

I do not think, from an examination of the claims and specifica-

tions of the Stringfellow patent, that it was ever designed or used as an equalizer and is not, therefore, a prior invention. One of the models of this patent as now arranged produces equalization, but the larger model used on the hearing to the court does not; but whether the models can now be made to show equalization or not,

it seems clear, from the examination of the invention as
365 claimed and described by the inventor, that it was not designed for that purpose and was not so used. It was not known to the trade as an equalizer, but was not offered to the public for that purpose by the inventor, and ought not now be considered for the purpose of mitigating damages.

The question, then, recurs to the amount of damages w'.ich the complainants should recover.

The demand for the equalizing device was limited. The complainants had the facilities to fully and promptly supply all the demands of purchasers. They refused to grant licenses. There were but two establishments producing and selling the invention, viz., the complainants and the defendant. There is some testimony tending to show that some other similar device was in use, but no other producers had been pressing the sales of such articles for some years. There was a demand for this equalizer in certain parts of the country, where it was deemsd a very necessary and desirable article. The purchasers were therefore seeking it, and so long as the trade offered it they would have purchased it from one or the other of these establishments. Since my former report the defendant has produced, upon the demand of the complainants, a list of his customers to whom this article was sold. This list has been compared with complainants' books, and one of them testifies that, with the exception of twelve firms, every one of the defendant's customers had been customers of the complainants previous to defendant's infringing. The testimony also shows that, with one exception, at or near each of the places where these twelve new dealers were located complain-

ants had agents or customers who could have supplied the
366 public at those places with rods. The defendant, as a witness, himself concedes that if his product had been out of the market his customers could not well have obtained these rods from any one else but from the complainants, and says he does not know of any good reason why they would have continued to buy their equalizers of complainants if he had not been manufacturing.

Complainants have filed an exhibit of their sales, which shows that that maintained them, with a slight increase, from 1880 to 1883, when the result of defendant's infringement began to be felt. In 1884 their sales had fallen off almost one-half. This decrease continued until the final hearing of this case, when an injunction was allowed and issued restraining defendant from further infringement. The sales of the complainants during the first three months after the injunction was in force nearly doubled, and rapidly advanced towards their former magnitude.

The master then, briefly recapitulating these facts, finds that there were substantially but the two firms—the complainants' and the defendant's—to sell to the trade this invention; that defendant, having

been a former employee of complainants, familiarized himself with their trade, and thereby was specially fitted to make his competition hurtful; that out of the seventy-three customers the defendant reports as those to whom he supplied this device all but twelve had been former customers of complainants; that complainants' sales were well maintained until defendant's infringement began, when they fell off very nearly in the proportion that defendant's increased, and that very promptly after defendant was enjoined com-
367 plainants' sales rapidly returned and doubled in the first three months; that defendant himself concedes that he does not know of any good reason why complainants' customers would not have continued to purchase from them if he had not been manufacturing. For these and other reasons disclosed in the testimony, the master feels justified in concluding that complainants would have made most of these sales which the defendant made if he had not been an infringer and competitor.

The only question that remains is, What proportion of these sales would complainants have made? The burden is on the complainants to show this, but they are required to establish it only by a fair preponderance of testimony. It is, in the very nature of the case, difficult to prove by exact figures.

As before stated, the nature of the defendant's infringement and competition was intentional and with full knowledge of the risks assumed, and he is not, therefore, in an attitude to ask for the benefit of the doubts presented in the testimony. Such doubts should be resolved against him.

The only testimony offered to throw any light on the question as to how many of the sales that he made were from new territory and to parties who were new to the trade, and were therefore his own special customers, was produced in reply to complainants' demands and as part of their evidence. The defendant has either not been able or willing to offer any evidence to aid the master in determining how many of these sales were the result of his own solicitation or owing to the superior merits of his products or inducements offered by him, or any reason which would tend to show that they were sales which complainants would not have made had he not been offering this infringing and rival device. The preponderance of the proof is with the complainants on all these points.

368 The Exhibits 2 and 3 and schedules show, as set forth in in my former report, that the defendant sold the following number of sets of rods and sizes, viz:

9,952 sets of steel rods, $\frac{1}{2}$ inch.
5,005 sets of steel rods, $\frac{5}{8}$ inch and larger.
611 sets of rods of "Stringfellow form," $\frac{5}{8}$ inch.
1,034 sets reported October, 1887, by defendant as made since his former return to court, $\frac{5}{8}$ inch.

16,602, total sets.

These sales were all made in a part of 1882 and 1883, 1884 and fore part of 1885, except the sales made under leave of the court after the decree and injunction. The sales made in the years named

were all made to seventy-three customers and dealers, sixty-one of whom had been regular customers of the complainants before the defendant began his infringement and offered the same article to the trade at a reduced price. About ten per cent. of these sales were made to new customers, which were probably the result of defendant's solicitation and inducements. The complainants' sales had decreased from 9,900 in 1881—the year before defendant began his infringement—to 5,343 in 1884, when defendant was in full competition. The defendant's sales in the three years aggregated within a small number of 15,000, or within a fraction of 5,000 per year; so that in the year 1884 defendant's sales were only about ten per cent. less than complainants', and complainants' decreased sales from 1881 were about equal to defendant's entire sales. The sales made by defendant to the twelve new customers who had purchased from the complainants were a little less than ten per cent. of his
369 entire sales. All of his remaining sales were made to complainants' old customers; ten per cent. were made to new customers. I allow ten per cent. more as sales that would nor have been made by complainants, which I think is a fair concession in defendant's favor and as much as he can claim under the proof. I therefore find and report that of the 16,602 sets sold by defendants, complainants would have sold 13,282 had the defendant not been an infringer. Of this number 7,962 were ½-inch rods and 5,320 were ⅝-inch rods.

Complainants show that the average cost of each set of one-half-inch rods was 20.2 cents. The testimony as to a fair manufacturer's profit varied from 20 to 50 per cent. In this case I think it should be the latter rate. This would make the average cost of each set, material and manufacturer's profit included, 30.3 cents per set. The selling price of these rods was 90 cents per set, which would give complainants a *new* profit of 59.7 cents per set on the one-half-inch rods, which they would have realized if they had made said sales. The five-eighth-s-inch rods and larger sizes cost for labor and material 22.75 cents per set. Adding to this a manufacturer's profit of fifty per cent., I find the total cost of said sizes 34.125 cents per set. They were sold for ninety cents per set, which would leave the net profit on each set $55.875 cents, which complainants would have realized if they had made said sales.

The account would then stand as follows:

7,962 sets ½-inch rods, at net profit of 59.7 cts.		$4,753 31
5,320 sets ⅝-inch rods, at net profit of 55.875 cts.		2,972 55
13,280 sets.	Total profit	$7,725 86

370 During the period of his infringement the defendant sold his *own*-half-inch rods about 30 per cent. lower than the complainants. During the years 1882 and 1883 complainants maintained their prices, but after January 1st, 1884, finding it necessary to reduce their prices to meet defendant's competition, they sold their rods at 90 cents instead of $1.125, their former price. The testimony shows that they sold 3,351 sets at this enforced reduction.

Their loss of profits on their sales amounted to $754.65. This was a pecuniary injury caused by the infringement, for which the complainants are entitled to compensation.

Adding this item to the sum above found due for profits on 13,280 sets of rods, which I find complainants would have sold had the defendant not been an infringer and competitor, it makes a total sum of eight thousand four hundred eighty and $\frac{51}{100}$ ($8,480.51), which I report as "the damages suffered by the complainants by reason of the unlawful acts of the defendant in his infringement."

I file herewith Exhibits A and B, which were filed with my former report herein, and also Exhibit C of testimony taken on the new reference, all of which I ask shall be made a part of this report.

Respectfully submitted.

A. J. RICKS,
Special Master.

371 And afterwards, to wit, the following, marked "Exhibit 'C' to Report of Special Mas-er," was filed and which is in the words and figures following, to wit:

CLEVELAND, O., *Nov'r 19th*, 1887.

U. S. District Court, N. D. Ohio, E. Div.

TOPLIFF AND ELY
vs.
I. N. TOPLIFF.

To A. J. Ricks, Esqr., commissioner:

I respectfully report that I have manufactured 1,034 and no more sets of the equalizers covered by the order in this case since last report.

I. N. TOPLIFF.

Received and filed Nov'r 26th, 1887.

A. J. RICKS,
Special Master.

372 THE UNITED STATES OF AMERICA, *Northern District of Ohio, E. D.*

In the Circuit Court.

TOPLIFF & ELY
vs.
I. N. TOPLIFF.
Before A. J. Ricks, Esq., Special Master.

Testimony Taken Thursday, June 30, 1887.

Present on the part of the complainants: H. S. Sherman, Esq.
Present on the part of the defendant: Hon. J. C. Hale.

ISAAC N. TOPLIFF, the defendant, being called as a witness on behalf of complainants, testified as follows:

(By Mr. SHERMAN:)

Q. You were asked to produce a list comprising the names of all

the customers to whom you sold equalizers from the time you began manufacturing until the present time. I will ask you if that is the list you pr-duce. (Papers shown witness.)

A. I should think so.

Q. State whether that includes all the persons, firms, or corporations to whom you have sold equalizers during the period mentioned.

A. I suppose it to.

Q. What do you know about it?

A. Nothing more than what I told my book-keeper or manager—to take the names off and make out a list. I have not examined the books myself.

373 Q. Well, are you willing to take that as your statement covering all the customers that you have had during this period?

A. I would not swear that it would cover them all; no, but it is what I suppose to. Whether the book-keeper overlooked any or not I do not know.

Q. Who is your book-keeper?

A. A man by the name of Chesnutt. I think this was taken off, though, by my manager, Todd.

Q. Who would know whether that list comprises all the sales that you have made?

A. To all the parties?

Q. Yes, sir.

A. Well, I think that Mr. Todd would know whether that was a complete list.

Q. What is Mr. Todd's full name?

A. William P. I will say that those were taken from our order book, and they would be less likely to be correct than to take them from our sales book. There might have some gone on the sales book—that is, a set or two that a man might order that did not go onto the order book at all, so that there might be a discrepency of ten or fifteen sets.

Q. In your belief the discrepency, if any, would not amount to more than a few sets?

A. I do not think it would amount to five sets, if any.

(For the purposes of this hearing it was agreed that the list produced by the witness might be taken as a true and full list of the names of the persons, firms, or corporations to whom the de-
374 fendant, Isaac N. Topliff, sold equalizers from the time he began manufacturing to date. Thereupon complainants' counsel offered the list in evidence, and the same was marked Exhibit —.)

Q. Mr. Topliff, when you were travelling for Topliff & Ely, before you commenced to manufacture here in Cleveland, you sold some of these equalizers for them, did you not?

A. I presume so.

Q. And as such travelling agent you assisted in introducing the equalizers in the market, did you not?

A. I presume so; yes, sir.

Q. How familiar are you with the devices used in the manufacture of carriages for the last six or eight years?

A. Oh, I am fairly familiar with them.

Q. Have you a knowledge of most of the articles used by carriage manufacturers in the manufacture of carriages during the last six or eight years?

A. Well, perhaps not as familiar within the last six or eight years as I was six or eight years before that, because at that time I was travelling among carriage-makers all the time. Since then I have not been among them a great deal.

Q. Will you describe what device for equalizing the action of half-elliptic springs other than those made by you and Topliff & Ely you have seen in use.

Objected to by counsel for defendant. Objection overruled.

A. I have seen the Saladee equalizers, and I have seen the Pennoyer at Chicago.

Q. The Pennoyer equalizers that you speak of are those that you testified to before in your former examination, are they not?

375 A. No, sir; he makes a spring that equalizes itself without the use of any rods. He is introducing them quite extensively; has within the last few years.

Q. Then you call that an equalizer?

A. That is what he advertises it—self-equalizing springs.

Q. What kind of springs does that equalize?

A. Half-elliptic side springs.

Q. How long has it been in use or on the market?

A. Three or four years, I should think; perhaps longer; but I have known of them three or four years.

Q. What sort of an equalizer is that? How is it constructed?

A. The spring—a part of it—goes below a certain line and takes up part as the other part lengthens.

Q. Well, with the spring used by Pennoyer could you apply the equalizer that you use?

A. It would not be necessary, according to his advertisement.

Q. Could you do it?

A. Oh, yes; we could do it.

Q. Could you use the same spring?

A. We could use the same spring.

Q. I thought I understood you to say that those springs did not require any rod at all.

A. No, sir; not as he advertises them. I do not know anything about the working of them. I have simply seen them.

Q. Have you seen a number of them?

A. Yes; I have seen quite a number. I have never thoroughly tested them how they were. I never rode in one of the wagons to try them. I have seen them standing in repositories. I

376 would say that on my trip to California last winter I saw quite a number of other equalizers than those made by Top-

liff and Ely or myself in use; I presume half a dozen different kinds of equalizers.

Q. Using the rod?

A. Using the rod.

Q. In the same way that these are used?

A. Yes, sir; in the same way.

Q. Well, were they similar to these?

A. Something similar, but made different.

Q. Do you know who made the Saladee rods and put them on the market?

A. I think they were made in Pittsburgh. I do not know but Saladee made them.

Q. How long ago was that?

A. It was fifteen years ago, I should think.

Q. That was before you commenced to manufacture?

A. Yes, sir.

Q. Have you known of any made later than that?

A. By Saladee?

Q. By anybody, on the market, except those that you and Topliff & Ely make?

A. As I say, I saw those on the buggies in the West in a number of cases.

Q. Do you know where those came from?

A. No, sir; I do not.

Q. Do you know whether they came from your manufactory?

A. I know they were none of my make and they were not the Topliff and Ely make. They were quite different in
377 make. I also heard that there was a malleable rod, but I have neve seen those that they are making at the Malleable works here in Cleveland.

Q. Similar to the rods used by you and Topliff and Ely?

A. Yes, sir.

Q. Are you familiar with the different patterns of rods made by Topliff & Ely during the last year?

A. Quite familiar.

Q. You know them all?

A. I presume so.

Q. You were asked to produce a statement of the number of equalizers sold, the dates of their sale, and the names of the parties sold to in the notice given you.

A. Yes, sir.

Q. Have you that statement?

A. I believe this is the statement. The book-keeper made this out.

(The witness produced a paper, which was offered in evidence by complainants and marked Exhibit —.)

Q. Will you take that list and select from it the hardware dealers in it and the carriage manufacturers in it?

A. Well, I do not know that I should know them all. I cannot

tell. I am not familiar enough with the names of them, but I think they are mostly carriage-makers, but I could not state.

Q. Referring to this first list containing the names of all your customers, in case it should turn out that these individuals or companies named in this list had been former customers, regular customers of Topliff & Ely, do you know of any reason why they would not have continued to buy the equalizers of Topliff & Ely if you had not been manufacturing?

378 Objected to by defendant on the ground that it calls for speculation as to the future and not for a fact. Objection overruled; to which ruling the defendant then and there excepted.

A. I do not know anything about it.

Q. Well, do you know of any reason why they would not?

Same objection, ruling, and exception.

A. No; I do not know as I do.

Q. You know this fact, that during the time that you have been manufacturing you and Topliff & Ely were the only two parties from whom they could have obtained these equalizers.

A. No; I do not know that fact, either.

Q. Do you know of anybody else, then, from whom they could have obtained them?

A. No; I do not know that I know of any one that was regularly in the business, still I know that a good many made the rods themselves.

Q. But was there any person, firm, or corporation from whom those dealers could have obtained these equalizing rods except from you and from Topliff & Ely?

A. I do not know of any one that was in the business excepting Saladee for awhile.

Q. And that was some fifteen years ago?

A. That was before this, yes, sir.

No cross-examination.

379 GEORGE H. ELY, one of the complainants, being called in his own behalf, testified as follows:

(By Mr. SHERMAN:)

Q. You take the list of Isaac N. Topliff's customers and state what you know about them as being customers of yours and how long they have been customers of yours.

A. Nearly the entire list have been customers of ours at one time or other. There are a few names here where the firm has changed. Here is Hiram W. Davis & Co., successor to Davis, Gould and Co.

Q. Do you know about when that firm was changed?

A. I am not positive about the date. I think it was some time within eighteen months, and so, in testifying that these were customers of ours before he manufactured rods, I would claim that some of the firms of which these are the successors were customers

of ours, but not this identical firm. With that understanding, all of the parties on this list were customers of ours previous to the time he commenced to manufacture, with the exception of two or three who com*m*-ced business during the time that he manufactured.

Q. Were those customers of your- before Isaac began manufacturing?

A. Yes, sir; and have been customers of ours since, with the exception of this list (Exhibit —), comprising twelve names.

Q. Take Isaac's second list (Exhibit —) and state whether, at the different places where the parties lived, or in that vicinity, you had dealers in your equalizers who could have supplied those people.

Objected to by defendant. Objection overruled. Exception by defendant.

380 A. There are several here in Minnesota. We had two or three dealers buying our rods extensively in St. Paul and Minneapolis. The next is St. Louis. We had four or five dealing in our goods extensively there—our rods. Penn Yan, New York, and Port Byron—I do not remember that we had any one at those particular places, but in all the principal cities in New York State there were dealers. Kalamazoo, Michigan, is the next. We had two or three parties there, also in Detroit, handling the rods. Burton, Vermont—none nearer than Boston or Springfield, Massachusetts, as I remember. Salt Lake City—we had none out there. Gananoque, Ontario—there were several parties in Ontario. We have a dealer in Kingston; so that the Salt Lake City one is the only one not near a customer of ours.

Q. You have testified as to the cost of making these equalizers as made by you. What would you say is a fair manufacturer's profit on those goods?

Objected to by defendant. Objection overruled. Exception by defendant.

A. We manufacture several patent devices for other parties, and on none of them do we receive over twenty per cent. of the cost.

Answer objected to by defendant as not responsive. Objection sustained.

Q. Well, what would you say would be a fair manufacturer's profit?

A. Then I will say that for the past few years twenty per cent. is a large profit for manufacturing.

Answer objected to by defendant. Objection overruled. Exception by defendant.

381 Q. What would you say would be a fair manufacturers' profit on those goods?

Objected to by defendant. Objection overruled. Exception by defendant.

A. Fifteen per cent.
Q. Fifteen per cent. of what?
A. Of the cost.
Q. On the actual cost?
A. Yes, sir.
Q. Cost of what?
A. Cost of material and making and putting on the market.
Q. Are you familiar with the devices for equalizing the action of elliptic springs, or how familiar are you with those devices on the market?
A. I am quite familiar.
Q. State what other devices for this particular purpose have been sold on the market, to your knowledge, during the period since 1880.

Objected to by defendant. Objection overruled. Exception by defendant.

A. I know of none other than those that have been made by Mr. Topliff.
Q. By Mr. Topliff and yourselves?
A. Those are the only ones that I know of. I know of none put upon the market. There may have individuals manufactured for their own use, but none for sale on the market.
Q. What means have you of knowing whether or not any other devices for a similar purpose have been on the market during
382 that period?
A. By reading half a dozen or more carriage publications in which such devices, if extensively used, are noticed; by consultation with parties who traveled for us and visited the different carriage shops, and, to a limited extent, by a personal visitation of the carriage shops.

Defendant objected to the answer and moved to strike it off the record. Objection overruled and answer allowed to stand. Exception by defendant.

Q. How long have you been in the business of manufacturing and selling these equalizers?
A. Since 1871; possibly 1870. I am not sure—1870 or 1871.
Q. What competition, if any, have you met with in your business in the sale of these equalizers outside of Isaac N. Topliff?

Objected to by defendant. Objection overruled. Exception by defendant.

A. None whatever, except in the case of one or two carriage-makers. Pennoyer was one who we learned was making a few sets, and one or two other parties. What became of those parties we never could learn. We never could learn that enough was done to make it any object to pay much attention to it.
Q. Those are the parties spoken of in your former testimony in this case?
A. I think those are the parties.

Cross-examination by Judge HALE:

Q. Your firm is engaged in the manufacture of carriage hardware, and the manufacture and sale of equalizers is only one branch of your business?

383 A. Yes, sir. Understand me, I do not mean to say exclusively carriage hardware.

Q. Oh, no; but at all events the manufacture of the equalizer in controversy in this suit is but one branch of your business?

A. Yes, sir.

Q. As I understand you, you say that all of the parties whose names are contained in the first exhibit (Exhibit —) produced to-day have at some time been customers of yours, except those whose names are contained in the second list?

A. Yes, sir; as limited in the change in firm that I spoke of in my direct examination.

Q. Do you mean to say that you had sold equalizers to all named in that list, or were they customers in other branches of your business?

A. All except that second list were customers, and all were customers in equalizers except six.

Q. Prior to the time Mr. Topliff began manufacturing?

A. Yes, sir; except in cases where parties have engaged in business since.

Q. And what you mean to say is that the firm of Topliff and Ely had, prior to the time Mr. I. N. Topliff, the respondent, began manufacturing the equalizers, sold equalizers to all named in this list, except the half dozen that you now name, and the names contained in the second exhibit. Is that what you mean to say?

A. Yes, sir; that is what I mean to say.

Q. Do you know when Mr. I. N. Topliff began to manufacture?

A. I think that he testifies that he began manufact*u*ring in——

384 Q. I am asking you whether you know now.

A. Only from his testimony.

Q. What date do you assume to be the date when you answer that prior to the time he began to manufacture you sold?

A. The date on that list.

Q. What date is that?

A. 1883, 1884, and 1885, I think, commencing in 1883.

Q. On what list?

A. On this list (Exhibit —). I took his own list as he gave it.

Q. You began the manufacture of the equalizers, you say, as early as 1871?

A. Yes, sir.

Q. And under what patent did you manufacture the equalizers for the several years after 1871?

A. Under a patent taken out jointly by John N. Topliff and myself.

Q. And after that you bought the Auger patent, did you not?

A. Yes, sir.

Q. When did you buy that?

A. I cannot give you the date here. It was shortly before the commencement of this suit, whenever that was. It was immediately preceding the commencement of this suit—I should think within six months. I can't fix the date any nearer than that.

Q. Have you ever manufactured any under the Auger patent?

Objected to by complainants. Objection sustained. Exception by defendant.

Thereupon counsel for the defendant stated that he proposed to show, if permitted, that Topliff & Ely purchased the Auger
385 patent at the date —— —, ——, and have since that time neither manufactured nor sold equalizers under that patent.

Q. You are familiar with the Auger patent and the Topliff and Ely patent, are you not—with the two patents?

A. I am familiar with the patent of Topliff & Ely. The Auger patent—it is some time since I have looked at it, but I think I remember what is it.

Q. Well, you have testified heretofore as to the particulars of that patent, and all about it, have you not?

A. Yes, sir. I can testify to the particulars of a patent at a certain date, and five years afterward I might need to refresh my memory before I could testify to it.

Q. Well, you are familiar with the principles embodied in the two patents, are you not?

A. At the time I testified I could give the claim of the patent; to-day I could not.

Q. What do you say to-day as to being reasonably familiar with the principles of the two patents—are you?

Objected to by complainants. Objection overruled. Exception by complainants.

A. Yes, sir; I am reasonably familiar.

Q. What is the difference between the two, the Auger and the Topliff and Ely, patents?

Objected to by complainants. Objection sustained. Exception by defendant.

Q. The use of the equalizer in controversy is somewhat limited, is it not?

A. Possibly. The use of buggies is limited to a certain ex-
386 tent. I do not know that I understand your question.

Q. The class of buggies to which your equalizer is attached is limited?

A. It is limited to those which use half-elliptic side springs.

Q. And the comparative number of buggies to which this equalizer can be attached is small, is it not?

A. Compared to the whole number made; yes, sir.

Q. So that but few equalizers would be sold to any one manufacturer in the ordinary course of trade?

A. Well, I would not say that. Some manufacturers may manu-

facture almost exclusively the kind that they use these on. For instance, the manufacturers of sewing-machine wagons. Some manufacturers make special-y of them and use these almost exclusively.

Q. Well, as a matter of fact, among your customers, so far as you know, the trade in the equalizers has been to manufacturers and where the sale was limited?

A. Taking the country through, it is. In certain sections there is a large proportion of them sold.

Q. Take this article that you are manufacturing, the nature of the trade, taking it as you know it to be, and the manufacture and sale, scattered as it is, would you not say that fifteen per cent. as a manufacturer's profit was a very low one?

A. No, sir; I would not.

Q. Taking into consideration the introduction and the sale scattered over the country, limited as it is, would it not be more sensible to say twenty-five or thirty per cent.?

A. No, sir; it would not. We manufacture articles for other parties that have nowhere near as large a sale as that on
387 much less manufacturer's profit to ourselves. All we have is a manufacturer's profit, so I know what it is. We are manufacturing two different articles at the present time which we do at less than fifteen per cent. profit to ourselves.

Q. And make all the sales and collections and everything of the kind?

A. Yes, sir.

Q. When you say that a fair estimate of the manufacturer's profit upon this equalizer is fifteen per cent., do you include the cost of manufacture, the expenses of the sales, shipments, collections, and the risk attending collections and the risk of loss?

A. Yes, sir.

Q. Do you say that in the ordinary way of doing business in the manufacture of an article similar to the equalizer, where the manufacturer purchases the material, supplies the labor, manufactures, sells, makes collections, and takes the risk of loss, that a fair profit for that whole business upon the first cost of material and labor would be fifteen per cent.?

A. I would not want to say that as applied to all articles. Some have more risk than others. But an article of carriage hardware that would work right in our other business, taking the same class of trade we sell to, it would.

Q. Take it as an independent article in the ordinary business of manufacturing, do you say that a manufacturer would purchase the raw material, supply the labor, manufacture an article of that nature, sell it, make the collections, and run the risk of loss and do
388 it all for fifteen per cent. upon the cost of the raw materials and the labor? Is that the ordinary rule among manufacturers?

A. It was not ten years ago, but at the present time many manufacturers are wanting to work for that.

Q. You think that that would be the ordinary rule among manu-

facturers who are engaged in that kind of business—that they would do all that for fifteen per cent.—do you?

A. That would depend upon how bad they wanted the business, of course.

Q. You are an expert, of course.

A. No, sir; I am not an expert.

Q. Your attorney put you on here as such. You know the fact, Mr. Ely, that there are various manufacturers engaged in doing this kind of business for a percentage, do you not?

A. Yes, sir; we do it ourselves.

Q. Yes; but somebody besides "we" do it?

A. Oh, yes; certainly.

Q. And you are acquainted somewhat with the percentage that goes to the manufacturer, are you not?

A. Not much outside of our business; no, sir.

Q. You do not know anything about it outside of your own business?

A. I will not say that I do not know anything about it, but not enough to pass an opinion.

Q. What I want your opinion on is this: Taking the firms that do that business, or the corporations that do that kind of business, purchase the raw material, furnish the help, sell the article, make the collections, and run the risk of losses, what, so far as you
389 know, is the percentage usually charged for that kind of business?

A. I do not know, sir, outside of our own business.

Q. When you answer fifteen per cent. here for what you call manufacturer's profits, you confine it entirely to your own experience, and do not know what the outside rule is as to those charges?

A. There is no absolute rule.

Q. I am asking you whether you know what the outside rule is as to the charges for the manufacturer's profits outside of your own business.

A. I know there is no general rule.

Q. Well, do you know of what was charged for manufacturer's profits in any single instance outside of your own business?

A. Yes, sir.

Q. Give the instance.

A. I cannot give you the instance right off now except what would be from hearsay evidence.

Q. Can you give us from hearsay evidence a single instance?

A. Yes, sir.

Q. Give us the name of the man.

A. Well, that is what I am trying to think of and that is what I cannot think of. There is a party in Mansfield that manufactured an article that we are now manufacturing that he was doing at a ten per cent. profit, but of course I am not familiar with his books and so on.

Q. Do you know what the name of that man is?

A. That is what I have been trying to think.

Q. Can you give us a single instance in the years 1883, 1884, or

1885 of a single manufacturer who manufactured on a manufacturer's profit of fifteen per cent.?

390 A. Yes, sir; we have had shears manufactured for us by the Sandusky Tool Company on a less profit than that, according to their own statement.

Q. Manufactured and delivered right to you?

A. Delivered to us, which we put into articles which we were manufacturing.

Q. That is, you got them to manufacture shears?

A. We got them to. They go into a vegetable slicer.

Q. Who furnished the material?

A. They did.

Q. That is, you got them to manufacture a certain number of shears for you, and they did it at ten per cent. profit; is that it?

A. At less than fifteen per cent. profit, according to their own statements. Now I have to rely upon their statements.

Q. I am not on the percentage now, but I am trying to get at what they charged you less than fifteen per cent. for. They took an order from you to manufacture for you a certain number of shears, and they did that at a certain percentage on the first cost, as they called it. Is that it?

A. Yes, sir.

Q. Do you call that the same thing as buying the material, making the articles, selling it, making collections, and running the risk of loss?

A. I do.

Q. Then you mean to say that for giving an order to the Sandusky Tool Company for a certain number of shears to be manufactured expressly for and delivered to you there should be

391 the same percentage as for manufacturing an article, running the risk of selling it generally in the trade, making the collections for the sales thus made, and running the risk also of loss?

A. Yes, sir; I mean it to be the same exactly, for three-fourths of our connecting rods are made on special orders. A firm in Chicago sends to us to make some equalizers according to certain specifications. We make them and ship them to them and they pay us. The transaction is identically the same as our making our specifications and sending to the Sandusky Tool Company and they sending back the blades. We get those blades back and put them into the article we make. The other party gets the equalizers made according to his specifications and puts them into the article he makes.

Q. What is the ordinary royalty charged on a patented article of the kind of the equalizer?

Objected to by complainants. Objection overruled. Exception by complainants.

A. I know very little about it outside of my own business.

Q. You have dealt considerably in patent rights, have you not?

A. Not very extensively.

Q. Well, you are somewhat acquainted with the various patents and the license fee that is charged for patents?

A. Very little with license fees. I know very little about that outside of my own business.

Q. You have had some contracts as to royalty, etc., have you not, on patented articles?

A. Yes, sir; I have had. I said I know very little about it outside of our own business

Q. You were asked as to the sale of the equalizer in the
392 vicinity of the list that you say were not your customers. Just what do you mean by your answer to that question? Do you mean that you kept equalizers for sale in those places?

A. I mean that there were dealers in carriage goods who kept the equalizer in stock for supplying the trade about there.

(By the MASTER:)

Q. As your agents and customers?

A. As our customers rather than our agents. As a rule, we avoided selling to small carriage-makers, preferring to sell to large dealers and large manufacturers, and where we could we in many cases refused to sell to small carriage-makers, referring them to dealers in the vicinity, not caring for the retail trade, and in that way there might have been a whole nest of customers that we never would have supplied at all that would have been supplied with our goods through the dealers.

Redirect examination by Mr. SHERMAN:

Q. Mr. Ely, I wish you would tell me what you understand by manufacturer's profits.

A. If you ask me what manufacturer's profits are in law I do not know.

Q. What is known as manufacturer's profits in the trade generally?

A. I do not know what is considered a manufacturer's profit.

Q. I will put the question in a different way. Assuming that manufacturer's profits, in the language or meaning of the patent law, are those profits which enure to a manufacturer of an article over and above the cost of the material and cost of the production alone, what would you say would be a fair manufacturer's profit on this article in that sense?

Objected to by defendant.

393 A. Do you mean exclusive of all cost of taxes, insurance, selling, collecting, etc.—just a profit to be added to the raw material and the making and nothing else?

Q. Everything that goes into the production—the hand labor and the machine labor and the power and the raw material. Assuming that to be the manufacturer's cost, what per cent. would be a fair manufacturer's profit on this article?

A. Ten per cent.

Q. On the cost of material and production?
A. Yes, sir.

Recross-examination by Judge HALE:

Q. You said in your direct examination that a manufacturer's profit for the equalizers—a fair percentage—would be fifteen per cent. What did you mean by that?
A. I suppose the question meant the entire cost of doing the business—making collections, and so on.

By Mr. SHERMAN:

Q. Have you ever granted any licenses to any individual, corporation, or any person to manufacture under the patents owned by you and in suit here?
A. No further than to settle with one party—an innocent infringer who had made a few. We compromised a claim against him which was for less than twenty sets. Aside from that we never issued any licenses.
Q. And you have held your patents ever since you owned them as a strict monopoly to yourselves?
394 —. Yes, sir.

I. N. TOPLIFF, the defendant, being recalled on the part of the complainants, testified as follows:

(By Mr. SHERMAN:)

Q. How many of the new equalizers of the patterns shown in Exhibits "A," "B," and "C" have you made since the last hearing before the master?
A. I do not know.
Q. Will you produce a statement of the number and kind made by you since that time?
A. Yes, sir.
Q. And have it here next Tuesday, can you?
A. Yes, sir.

395 1883, '4, '5.

H. A. Moyer	Syracuse, N. Y.
Haydock Bros.	St. Louis, Mo.
R. M. Bingham & Co.	Rome, N. Y.
Parkhurst and Wilkinson	Chicago, Ill.
Winna, Burdick & Co.	Troy, N. Y.
McKinnon & Mitchell	St. Catharine's, Ont.
Lyons Mfg. Co.	Syracuse, N. Y.
Rohus and Scherer	Detroit, Mich.
Ling-Levoy Cge. Co.	Middleton, Ohio.
Laylor, McKay & Co.	Winona, Minn.
Shadbolt, Boyd & Co.	Milwaukee, Wis.
Abbott Bgy. Co.	Chicago, Ill.
R. D. Cone	Winona, Minn.
Action Mfg. Co.	Cincinnati, Ohio.

Brewer & Rhodes ..... St. Paul, Minn.
J. M. Pottle & Son ..... Minneapolis, Minn.
Baker, Gray & Co. ..... Detroit, Mich.
Seehler & Co. ..... Cincinnati, Ohio.
J. L. Spencer & Co. ..... Oneida, N. Y.
Kelley, Mans & Co. ..... Chicago, Ill.
Fish Bros. & Co. ..... Racine, Wis.
Hubbard & Mayer ..... Flint, Mich.
Harrison & Knight ..... Minneapolis, Minn.
E. D. Clapp Mfg. Co. ..... Auburn, N. Y.
Paddock-Howley Iron Co. ..... St. Louis, Mo.
Emerson and Fisher Co. ..... Cincinnati, O.
Henney Bgy. Co. ..... Freeport, Ill.
Fort Scott Cge. Wks. ..... Ft. Scott, Kans.
396 Wilcox and Howe ..... Birmingham, Conn.
Kelley Bros. ..... Marietta, Ohio.
R. B. Porter & Sons ..... Baltimore, Md.
A. H. Hopper & Co. ..... Salt Lake City, Utah.
S. Toomey's Sons ..... Canal Dover, Ohio.
Conrad B. Day & Co. ..... Philadelphia, Pa.
Geo. Cooper & Co. ..... Cleveland, Ohio.
J. J. Deal ..... Jonesville, Mich.
Geo. A. Amsley & Co. ..... Richmond, Va.
Rodgers Platform Wgn. Co. ..... Mason, Mich.
Hiram W. Davis & Co. ..... Cincinnati, Ohio.
Nicols and Dean ..... St. Paul, Minn.
Cray & Rood ..... Toledo, Ohio.
Bradley, Hastings & Co. ..... Boston, Mass.
Chas. Beacher ..... Minneapolis, Minn.
Geo. Enger & Co. ..... Cincinnati, Ohio.
Kalamazoo Wgn. Co. ..... Kalamazoo, Mich.
Milburn Wgn. Co. ..... Toledo, Ohio.
Gate City Cge. Co. ..... Winona, Minn.
Henney & Lacroix ..... Montreal, Ont.
Beck & Corbitt Iron Co. ..... St. Louis, Mo.
D. McVan ..... Louisville, Ky.
Coombs and Co. ..... Ft. Wayne, Ind.
Romeo Cge. Co. ..... Romeo, Mich.
E. M. Miller & Co. ..... Quincy, Ill.
Waterman & Campbell Iron Co. ..... St. Louis, Mo.
C. M. Clark & Co. ..... Cleveland, Ohio.
M. G. Cartiss ..... Troy, N. Y.
Geo. Beebe ..... Penn Yan, N. Y.
397 J. J. Mack and Co. ..... Pt. Byron, N. Y.
Neuve and Co. ..... Cincinnati, Ohio.
G. W. Richards ..... Norwood, N. Y.
B. Veer Kamp & Sons ..... Cincinnati, Ohio.
Cook Cge. Co. ..... Cincinnati, Ohio.
Short & Smith ..... Syracuse, N. Y.
Clark & Co. ..... Lansing, Mich.
Watertown Sp. W'gon Co. ..... Watertown, N. Y.

S. McCammon ---------- Gananogua, Ont.
Lane, Lay & Co. ---------- Kalamazoo, Mich.
Jackson Cge. Co. ---------- Jackson, Mich.
Winona Cge. Co. ---------- Winona, Minn.
Morley Bros. ---------- East Saginaw, Mich.
C. J. Ufford ---------- Burton, Vt.
Detroit Cge. Woodwork Co. ---------- Detroit, Mich.
Geo. De B. Keim & Co. ---------- Philadelphia, Pa.

398 *Statement of Numbers of Equalizers Sold and Dates Thereof to the Following Parties.*

Laylor, McKay & Co., Winona, Minn.

Feb'y 24th, 1883 ---------- 12 sets.

R. D. Cone, Winona, Minn.

April 7th, 1883 ---------- 30 sets.

J. N. Pottle & Son, Minneapolis, Minn.

April 7th, 1883 ---------- 50 sets.

Waterman-Campbell Iron Co., St. Louis, Mo.

May 29th, 1883 ---------- 24 sets.
Aug. 4th, 1883 ---------- 20 sets.

George Beebe, Penn Yan, N. Y.

Aug. 11th, 1883 ---------- 20 sets.
Nov. 27th, 1883 ---------- 3 sets.
Dec. 1st, 1883 ---------- 17 sets.
Dec. 14th, 1883 ---------- 11 sets.
M'ch 3rd, 1884 ---------- 20 sets.
M'ch 5th, 1884 ---------- 4 sets.
May 13th, 1884 ---------- 30 sets.
July 8th, 1884 ---------- 4 sets.
July 14, 1884 ---------- 20 sets.
Aug. 6th, 1884 ---------- 10 sets.
Aug. 15th, 1884 ---------- 12 sets.
April 25th, 1885 ---------- 6 sets.

J. J. Mack & Co., Pt. Byron, N. Y.

399 Oct. 30th, 1883 ---------- 150 sets.

S. McCannon, Gananogue, Ont.

Feb. 1st, 1884 ---------- 6 sets.
Feb. 7th, " ---------- 44 sets.
M'ch 13th, 1885 ---------- 50 sets.

Lane, Lay & Co., Kalamazoo, Mich.

Feb. 12th, 1884 ---------- 60 sets.
Ma'ch 6th, 1884 ---------- 18 sets.

M'ch 22d, 1884	25 sets.
April 1st, 1884	100 sets.
June 11th, 1884	50 sets.
June 23d, 1884	50 sets.
June 27th, 1884	50 sets.
July 26th, 1884	50 sets.
Aug. 14th, 1884	50 sets.
Aug. 30th, 1884	50 sets.
Sept. 22d, 1884	50 sets.
April 17th, 1885	25 sets.

Winona C'ge Co., Winona, Minn.

Feb. 21st, 1884	12 sets

C. J. Ufford, Burton, Ver.

M'ch 8th, 1884	20 sets.

A. H. Hopper & Co., Salt Lake City.

July 23rd, 1884	4 sets.

400 Chas. Beacher, Minneapolis, Minn.

M'ch 2nd, 1885	130 sets.
April 10th, 1885	20 sets.
Total	1,307 sets.

401 In the Circuit Court of the United States, Northern District of Ohio.

TOPLIFF AND ELY
vs.
ISAAC N. TOPLIFF.

Testimony taken on re-reference before A. J. Ricks, Esq., a special master, on the part of the defendant, January 26, 1888.

JAMES L. DAUGHERTY, being sworn, testified as follows:

By Gen. LEGGETT:

Q. You may state what your business is.

A. I am the manager of the Cleveland Electrical Manufacturing Company.

Q. How long have you been engaged in manufacturing?

A. Well, I have been engaged, directly and indirectly, in manufacturing for twenty years.

Q. What do you regard as a reasonable manufacturer's profit in manufacturing?

Objected to.

A. Well, ordinarily, on a general line of goods, from forty to fifty per cent., I should say.

Q. Suppose the goods are a specialty.

A. That is what I refer to now, specialties.

Q. On general manufacturing not a specialty, what?

A. Well, I should put it ten per cent. lower—thirty per cent.

Q. You may state whether you speak from your own prac-
402 tice and experience or from your knowledge of business in general.

A. Well, I speak from both my own experience and from my general knowledge of the manufacturing business.

Cross-examination by Mr. SHERMAN:

Q. What business have you been engaged in? What articles have you been manufacturing for other people?

A. For the last five years we have been engaged in manufacturing specialties of our own, the Cleveland Electrical Manufacturing Company, and specialties on contract for other parties, patented articles of various kinds.

Q. To what extent were you manufacturing those?

A. In what particular?

Q. To what extent in number of articles annu-lly, we will say?

A. Well, that would be a pretty difficult question for me to answer.

Q. Name some of the specialties.

A. Well, we have been manufacturing a watchman's time detector. We manufacture annually about five hundred or six hundred, and then we — been manufacturing——

Q. What do those things cost apiece, on the average?

A. Well, about $30, I think; $25 to $30.

Q. You make them for how much?

A. Well, we estimate that our profit on those will run from 35 to 60 %.

Q. Over and above the $30 cost?

A. You mean what? Your first question was what it cost to manufacture them.

Q. What it costs to manufacture those things?

A. Yes, sir; about that; over and above what they cost. That is about right.

403 Q. Then would you say that you are selling them from $40 to $50 apiece. You are turning them over to the persons you make them for?

A. Yes, sir; at an advance. We are making them and putting them on the market ourselves. We are not manufacturing those on contract.

Q. You make a profit on those of from 30 to 35 and 60 %, do you?

A. Yes, sir.

Q. That is the total profit?

A. Yes, sir; that is about the to-al average profit.

Q. That includes the cost of selling—includes everything, does it not?

A. Well, my first answer was in reference to the cost of manufacturing and getting ready for the market.

Q. Have you ever manufactured anything of a kind or description that you do not sell yourself?
A. Yes, sir.
Q. That you manufacture for other people?
A. Yes, sir.
Q. What articles are those?
A. Well, we have manufactured a whip socket.
Q. For whom?
A. We manufactured a whip socket for—I can't recall the partie's name now.

(By Mr. LEGGETT:)

Q. Give his locality.
A. He lives in Girard, Ohio.

(By Mr. SHERMAN:)

Q. What other things have you manufactured for other people?
A. Those people?
A. Those same people or other people.
404 A. We manufactured a paper weight.
Q. For whom did you manufacture those?
A. We manufactured that for a party in Alabama.
Q. To what extent did you manufacture those?
A. I think we made three or four thousand of them.
Q. In one order?
A. No; I think there were several orders.
Q. Covering any period of time?
A. Yes, sir; about a year or a year and a half.
Q. What was the actual cost to you? You bought all the material, I suppose?
A. We purchased the material and labor for building them.
Q. What was the cost per weight?
A. I think fifteen cents was our price to him. That is my recollection now. I would not be positive about that.
Q. What did they cost you?
A. I think about—something less than ten cents.
Q. What other things have you been manufacturing for other people?
A. We manufactured a tobacco-cutting machine.
Q. To any extent?
A. I think we turned out something near a hundred of those.
Q. What other things have you manufactured?
A. I don't remember now particularly.
Q. What other articles, do you know, have been manufactured by other manufacturers? In other words, what general knowledge do you have of manufacturer's profits in the manufacturing business?
A. Only such as I would get in years of experience in
405 business and conversation and dealings.
Q. That is, your own experience?

A. Well, yes; my own experience, with that of others in the manufacturing business generally.

Q. Well, do not manufacturers' profits largely depend upon the amount or number of articles made—the amount of manufacturing done?

A. Yes, sir. That is what I based my variation in the profit from 30 to 50% on.

Q. Let me ask you, further, whether a manufacturer's profit would not be less per article where a very large number of articles are made yearly through a series of years?

A. Yes, sir—well, no, I don't think so. I think that where there is a very large number manufactured through a series of years that the manufacturer's profit would be larger, for experience would enable him to manufacture the articl-s at less cost and buy the material in large quantities, thereby saving in all those particulars.

Q. Would not his percentage of profit that he charges be less than if he made only a few?

A. No; I think not. I think that the more you manufacture and the longer you manufacture, the better your facilities, the better able you are to handle it, and the faster you can turn it out and cheaper. That is the general idea among manufacturers, I think—the more that is manufactured the more profit there is.

Q. Then, when parties are engaged in the general business of manufacturing, making a great many articles, and making it their business to make the articles, how is it that you say the percentage is less than it is where they make a few specialties?

406 A. How is that?

Q. You have stated in your examination-in-chief that for specialties you would say the manufacturer's profit would be in the neighborhood of from 40 to 60 %.

A. Yes, sir.

Q. Where it is in the general business of manufacturing, the profits would be about 30 %?

General LEGGETT: 30 to 40 %.

A. Yes, sir.

Q. Then how is it you reach that conclusion when you say the larger the business is, the greater the profit, and where you make specialties, the smaller the business on specialties there would be less profit?

A. I just stated the reverse from that. On specialties the profit would be greater.

Q. You did on direct examination. Now you say that to take a general business, where they make articles through a series of years and in great quantities, the manufacturer's profit would be greater.

A. Yes, sir; but then I speak now of specialties.

Q. You are confining your testimony altogether to specialties.

A. What I mean by the general line of articles is such as could be taken up and manufactured by anybody.

Q. Let me understand what you mean by manufacturer's profits. You define them.

A. I mean the difference between the actual cost of the material and labor to produce it and the price obtained for the article after it is ready for the market.

Q. Does that include in your estimate expense of officers
407 and all the expenses of running the business?

A. Yes, sir; that would include the entire expense of producing the article manufactured.

Q. Of all the salaries, interest on the plant, and labor of every kind?

A. Yes, sir.

Q. Expenses of shipment, insurance, taxes, and everything?

A. Yes, sir.

Q. Assuming that you are manufacturing an article that costs about twenty-two cents to make it and you have orders to make through a series of years in the neighborhood of ten thousand a year, would you or would you not say that ten cents profit would be, as a manufacturer's profit, rather excessive?

A. No, sir.

Q. You would not?

A. No, sir. In figuring estimates on manufactured articles of that kind we take the cost or supposed cost of the material and then we add sufficient to that to cover the incidental expenses, such as for all incidental fixed expenses, and then add the profit on that, over and above, from 35 to 50 %. And, as I stated before, if it is a specialty, and there is a long contract or a business that justifies us in preparing for manufacturing through a series of years a large amount, the cost of production, of course, is lessened and the profit increased.

Q. You charge your customers the same price, whether you make ten thousand or two hundred?

A. Well, yes; that would be—I could not say as to how
408 that would be in every instance, but I am basing my statement upon the general.

Q. I am getting at the rule with manufacturers, if there is any rule. I am getting at the rule on which you charge up your profits as manufacturers.

A. Well, I don't know that there is any fixed rule among manufacturers; but from my experience and the knowledge I have been able to gather in those particulars—my statements are based on that.

Q. You say they would charge all they could get?

A. Yes, sir; that is the rule with everybody.

Redirect examination by General LEGGETT:

Q. Where you have an order, say, to furnish ten thousand articles such as have been named here, you base your estimate—your original estimates—I understand you, upon the cost—that is, you would sit down and figure on the actual cost of the material, labor, etc.?

A. Yes, sir.

Q. Now, then, as you proceed from year to year and your men acquire greater facility in making, and you improve your machinery, perhaps to still further facilitate it, is it or is it not the practice

among manufacturers to add the increased facility to the profit afterwards—that is, they keep the price the same and make that much more profit?

A. Yes, sir; that is the general intention, where that can be done, where a trade can be established, so as to enable them to increase their profits by increasing their facilities and becoming more
409 expert in manufacturing by the use of machinery adapted to the manufacture of the specialty.

Recross-examination by Mr. SHERMAN:

Q. Then you would say it is a rule with manufacturers when they have established a price never to reduce it, even if they can make more profit?

A. It is a rule with them not to reduce it unless they are compelled to. Sometimes competition forces them to a reduction, but I am speaking now more particularly of specialties that are protected. I know that has been our rule, being continually in the manufacture of this one special-y, but at the same time seeking to reduce the cost as much as possible, increasing or enhancing the profit; at the same time we have been charging the same price.

Q. That is in your time detecter?

A. Yes, sir.

Q. How many of those do you sell a year?

A. About six to eight hundred. The cost—I would like to explain that a little in addition to what I said before—is the cost to produce the instrument alone. We sell them from $30 to $45, say, and we take contracts with establishments all over the country, where we equip them and put them in complete. Those prices would run from $125 to $2,000.

Q. For each machine?

A. Yes, sir.

Q. Are you making these for any particular firm or corporation or for yourselves?

A. No, sir; we own the patents and manufacture them for ourselves.

Q. The cost, you say, is about thirty dollars, and that you would sell for how much?

410 A. A machine that costs us thirty dollars we sell for fifty or fifty-five dollars. I disremember just now what the schedule price is.

Q. You deal in those things, too, do you?

A. Yes, sir—that is, we make more particularly a specialty of equipping plants with those.

Q. Have you the wholesale price for those?

A. That is the price I gave you for the instrument alone. The price charged for them when put up complete, with the labor and material necessary for equip-ing an establishment with them, is much greater.

Q. That is not the manufacturer's profit?

A. No; we manufacture a good many of the other articles that go with the equipment, such as batteries and wires and all the para-

phernalia; besides we manufacture a great many specialties we could put in in equip-ing light plants and all such plants as that.

411 F. L. RAYMOND, being sworn, testified as follows:

(By General LEGGETT:)

Q. What is your occupation?

A. I am in the organ business; manufacturing organs.

Q. How long have you been engaged in the manufacturing business?

A. Since 1873; most fifteen years—fifteen years in May.

Q. Are you acquainted with what is called manufacturer's profits, as generally understood in manufacturing?

A. Well, I thunk I do somewhat. I do in regard to our own business, and have observed others and had something to do with others.

Q. State whether you are manufacturing a specialty.

A. No, sir; not a specialty particularly. We have specialties in our organs, but then the organ itself is not a specialty.

Q. From your own experience and your knowledge of the transactions of others, what do you regard as a reasonable manufacturer's profit in manufacturing?

A. Well, sir, I would like to understand that question—whether that applies to goods generally manufactured without being exclusive or being protected.

Q. You may answer it both ways. If there is a difference between the manufacturer's profits in the two cases you may give it to me in each.

A. I would naturally suppose there was, as far as my observation goes. I should say the manufactured article that is generally manufactured, and then there are things that would affect that profit somewhat—that is, the facilities and the skill shown in producing it somewhat. I do not known as you wish we to take that into consideration.

412 —. What would you regard as a reasonable manufacturer's profit on general articles?

A. Well, I should say twenty-five to thirty-three and a third per cent. We have made more than that. We have made less. We have made considerable more in our business.

Q. Suppose that a contract is made with a man that has a patent, and you make them for him in large quantities, what is regarded as a reasonable manufacturer's profit in such cases?

Objected to.

A. Where it is manufactured for one that is protected—that has a manufacturer's profit?

Q. Well, I want the manufacturer's profit alone. I do not want the license fee or anything of that kind to go into it.

A. You mean by that that it is a specialty?

Q. Leave out the royalty. I want just the manufacturer's profit.

A. Well, I should say 40 to 50% on a specialty of that kind. That is my idea.

Cross-examination by Mr. SHERMAN:

Q. Why do you fix the profit on what you call specialties at a larger figure than on general manufacture?

A. Well, sir, I will tell you why. It is a thing we are not making right straight along. You can't make it for the same margin, the same profit, that you could a thing you are making steady.

Q. Suppose you would make them right straight along through a series of years, would that make any difference?

A. Yes, sir; I think they could be made for a less profit, making them steady.

413 Q. You would charge about the same profit you would charge for general manufacturing?

A. They could be manufactured for less profit where made right straight along and made in large quantities.

Q. You would fix the manufacturer's profit on those as about what you would on general business, would you not?

A. Well, if I was making them exclusively, in large quantities, probably it could be made down to——

Q. 25 to 33%?

A. Yes, sir.

Q. What do you mean by general business as used by you in your last answer?

A. Why, I mean—well, like our own business, for instance. We make nothing but organs, and are making them in large quantities, and it is a steady and ready sale.

Q. That is what you mean by general business?

A. By general business, yes, sir.

Redirect examination by General LEGGETT:

Q. You make different kinds of organs?

A. Well, yes; different combinations.

Q. You make them for the trade, or do you retail them yourselves?

A. No; we make them for the trade. We do not retail any to amount to anything. Our trade is all with dealers—wholesale them.

Q. You wholesale them simply?

A. Yes, sir.

(By Mr. SHERMAN:)

Q. This 25 to 33% that you have spoken of includes what—the cost of what?

414 A. Why, I mean by that I would regard that as none too much—in fact, as I said before, we have made a good deal more than that and have made some less. I mean that amount net—the net profit.

Q. Material, taxes, insurance—every expense you were put to?

Q. After every expense is paid that is net.

(By Mr. LEGGET:)

Q. From your experience in manufacturing would you regard it as safe to go into the manufacturing business to make less than 25% as manufacturer's profit?

Objected to.

A. No, sir; I would not.

415 H. H. GARARD, being sworn, testified as follows:

(By Gen. LEGGETT:)

Q. What is your occupation?

A. I am a carriage-maker.

Q. Where?

A. I am on Euclid avenue, 1239.

Q. How long have you been engaged in manufacturing?

A. Well, about eight or nine years for myself. I have been working at the business all my lifetime.

Q. Do you understand what is meant by manufacturer's profits in manufacturing?

A. I think I do.

Q. You may state what you regard as a reasonable manufacturer's profit in general manufacturing.

A. Well, of course it varies. Sometimes a man don't make anything. Sometimes he makes more.

Q. I am talking of what is a reasonable profit.

A. I should say that a man would not furnish up a plant and go to the expense of manufacturing unless he was sure of something in the neighborhood of 33%—33 to 40%—somewhere along there.

Q. Suppose he is not manufacturing a specialty—some one particular thing for the trade—would that make any difference?

A. If a man had a plant that was just adapted to one particular thing and sure to have enough of it, that would make a difference certainly; but if a man would come in and say, "For how much will you manufacture me a thousand pieces like this?" without any assurance of there being anything further of the same kind, you would have to charge a great deal more—twice as much, for
416 instance—because the tools you would put in shape for a specialty when that specialty was over your tools would be worthless.

Q. When you speak of the manufacturer's profit you estimate it upon what cost? What do you take into the account as cost?

A. Well, the cost is what the lumber and labor—the actual cost you mean, do you?

Q. Well, the cost you estimate upon.

A. Then the profit is added to that.

Q. State whether you take into account the general office expenses.

A. Oh, certainly.

Q. Your advertising and other expenses—that is, it takes all the general expenses?

A. There are two ways of — that. Suppose I have a factory and a man comes along and wants me to make a certain article for him, of course the selling profit would not be in that; but if a man is manufacturing anything he has got to count in his office expenses, advertising—all the expenses. You have to have a great deal larger profit to cover those. There are a great many things manufactured at from 50% to 75% profit. Selling goods cost- sometimes more than the manufacturing of certain articles.

Cross-examination by Mr. SHERMAN:

Q. In your estimate of 33 to 40 — as a reasonable manufacturer's profit you do not include any expenses of selling, do you?

A. I do not include the expenses of having a drummer out and run the risk of selling that way. That would include a man coming to the shop and buying of you.

Q. That would include simply that?

A. Yes, sir.

417 Q. How much have you manufactured? How familiar are you with manufacturer's profits?

A. I have been working at the carriage business ever since I was a boy. I have been manufacturing, myself, eight or nine years; I think going on nine years.

Q. Do you know what manufacturers generally charge as profit—as manufacturer's profit—in all businesses, generally speaking?

A. Generally in our business?

Q. No; generally in business—manufacturing business of all kinds.

A. Of course, in our business we buy cloth, we buy hardware and wood, and of course I know generally what profit there is on all that class of things manufactured—dry goods, hardware, axles and wheels, and springs and tire-, and all such things as that, you know. Of course, men that you buy of do not always tell you what profit they make; you have to guess at that.

Q. What you know about other manufacturers' profits is simply what you surmise, is it not?

A. What I pick up, certainly. I would not consider myself an expert on any man's profit. A carriage man's profit is probably about the average. A good many make a good deal more and a good many make less. A carriage-maker that has got a reputation will make 50% more, a good deal more, and some will lose money.

Q. They always charge as much as they can get?

A. No; we don't.

Q. They make their profits as big as they can?

418 A. Take an old-established manufactury. Their work is well known; known to be good work. They get just twice as much profit as a man that has just commenced.

Q. That is in the carriage business?

A. Carriage business. Most everything we buy we buy of manufacturers of specialties; axles, springs of all kinds, hardware of all kinds. The firms that have reputations get better prices for their

goods. Another man's goods may be possibly as good; we don't know it until we try it. Sometimes we try it and lose money by it.

419 WORCESTER R. WARNER, being sworn, testified as follows:

(By Gen. LEGGETT:)

Q. What is your occupation?

A. A manufacturer.

Q. How long have you been engaged in manufacturing?

A. For seven years.

Q. At what place?

A. Six years in Cleveland, one year in Chicago.

Q. What was your occupation prior to that?

A. Manufacturer of building machinery.

Q. Engaged in manufacturing?

A. Yes, sir; but not on my own account.

Q. How long have you been engaged in manufacturing?

A. Eleven years and seven are eighteen.

Q. Are you familiar with what is commonly understood as manufacturer's profit?

A. I have been interested in that all these years.

Q. You may state from your own experience and your knowledge of the business of others what you regard as a reasonable manufacturer's profit in general manufacturing.

A. Well, I should have to ask the question to be more definite, because it depends so much on the kind of manufacture. If you are manufacturing cotton cloth the tenth of a mill per yard is a profit. It would depend, too, on the genius and the facilities that the manufacturer had for manufacturing. I may illustrate, perhaps: If an article is made for four dollars and sold for five and I can by my genius arrange so as to make that article for two dollars I am not going to sell it for two and one-half.

Q. You are going to stick to the five?

420 A. I am going to stick to the five; so it depends on the facilities that the manufacturer makes—in fact, on the genius of the manufacturer in rigging up the tools. Sewing machines cost about fifteen dollars, I believe, and they are sold for sixty—forty-five to sixty—but that is not all profit, of course. There is the selling after that that comes out of it. I might say further, if I was to rig up to manufacture these gas fixtures I should figure on the start that I must have from forty to fifty per cent., and expect afterwards in competition that would be reduced.

Q. In the manufacture of articles such as are made in machine shops—articles that will sell for from sixty cents to a dollar—making them in considerable quantities, what would be regarded as a reasonable manufacturer's profit?

A. I should say for this——

Q. Understand me. I do not now mean to take into consideration the selling of them, just the manufacturing of them for the trade.

A. I should say for this, in my experience, if I could depend on a continuance of trade from year to year I——

Mr. SHERMAN: For a period of ten years.

The WITNESS: If I could depend on a continuance of the trade I should expect to get from thirty to forty per cent., certainly, at the beginning, knowing it to be subject to competition and reduction. We figure higher than that in our own work.

Q. How low a profit would you regard it as safe to go on and manufacture at?

A. I should not touch anything. In our present business we would not touch anything we did not see twenty-five per
421 cent. in pretty sure; but we want to see more than that, because it is subject to all the reductions that competition brings.

Cross-examination by Mr. SHERMAN:

Q. Suppose you were to enter into the manufacture of an article that cost about twenty-two cents and had an order for ten thousand a year for ten years, what would you say would be a fair manufacturer's profit on such a business as that?

A. Cost twenty-two cents?

Q. About twenty-two cents; yes, sir. Just the manufacturer's profit. You are making it for somebody else now.

A. That would depend on the tools I must get up for it. In that case I should probably do this: Say that cost twenty-two cents, I would expect to get, on what seemed to cost twenty-two cents—I would expect to get near thirty cents for.

Q. Would you say twenty-five per cent. on such business as that would be a fair manufacturer's profit through that period?

A. I should say I would start at twenty-five as the manufacturer's profit and then I should say make my tools so I would make forty. The facilities come in there afterward. The whole cost of a sewing machine—the labor costs six dollars—and that would depend on the facilities I would be able to arrange for it.

Redirect examination by Mr. LEGGETT:

Q. I show you Patent Office model connected with the issue of patent No. 31134 of January 15th, 1861, to C. C. Stringfellow and D. W. Surles, and ask you to examine the same, comparing it with Defendant's Exhibit X, Stringfellow Patent, and state whether the latter exhibit is constructed upon the same principle as the former.

422 Objected to.

A. There is no difference at all; those two are alike.

Q. You may state whether or not in your judgment as an expert that a carriage constructed with springs adjusted as in Exhibit X the arrangement of the springs is such as to equalize the strain between the two springs.

A. As constructed in Exhibit X, the weight on one spring does tend to equalize the weight of the body, but not to such good advan-

tage as if this was thrown forward, letting this be on a greater angle. If this was drawn forward on a greater angle it would be improved; it would be more sensitive. This has the same effect as if this was nearer horizontal.

423 I. N. TOPLIFF, being sworn, testified as follows:

(By Gen. LEGGETT:)

Q. You may state what your business is.

A. Manufacturer of specialties.

Q. How long have you been *ne*gaged in manufacturing?

A. I have been engaged eight years.

Q. How long have you been familiar with manufacturing so as to know anything as to the profits and losses in the business?

A. Thirty years.

Q. From your experience and your knowledge of the business of others, what would you regard as a reasonable manufacturer's profit in general manufacturing?

A. I should say twenty-five to thirty-three per cent., general manufacturers.

Q. How would that be effected in the manufacture of a specialty?

A. I should say that in specialties the profits should be greater—perhaps from thirty to fifty per cent.

Deposition endorsed as follows:

"No. 4289. Topliff & Ely *vs.* Isaac N. Topliff. Exhibit 'C' to report of special master. Filed March 30th, 1888. A. J. Ricks, clerk."

424 And afterward, to wit, on the 14th day of May, 1888, an order was made in this cause which is in the words and figures following, to wit:

JOHN A. TOPLIFF *et al.*
vs.
ISAAC N. TOPLIFF. } Chancery. 4289.

In this cause leave is given respondent to file exceptions to master's report instanter; to which order and action of the court the complainants except.

425 And afterwards, to wit, on the 14th day of May, 1888, there was filed in this court exceptions to the master's report by defendant and which is in the words and figures following, to wit:

In the Circuit Court of the United States, Northern District of Ohio, Eastern Division.

JOHN A. TOPLIFF and GEORGE H. ELY
vs.
ISAAC N. TOPLIFF. } In Equity. No. 4289.

And now comes the defendant, by his solicitors, and excepts to

the report of the special master filed herein on the 30th day of March, 1888, in so far as the same relates to the Stringfellow patent and the effect of the same upon the amount reported for the complainant-, and avers that in view of said Stringfellow patent the master should have reported only nominal damages.

M. D. & L. L. LEGGETT,
Solicitors for Defendant.

Cleveland, Ohio, May 14th, 1888.

426 And afterwards, to wit, on the 17th day of May, 1888, an order was filed in this cause, which is in the words and figures following, to wit:

TOPLIFF and ELY
vs.
ISAAC N. TOPLIFF. } 4289. Chancery.

This cause came on to be heard upon the exceptions of the defendant to the report of the special master heretofore filed and was argued by counsel; and thereupon, upon consideration, it is ordered that said exceptions be overruled, and that said report be confirmed. It is thereupon ordered that the defendant pay to the complainant- the sum of eight thousand four hundred and eighty and $\frac{51}{100}$ dollars, the amount found due in said master's report, within thirty days, in default of which an execution may issue as upon judgment at law.

It is further ordered that the defendant pay the costs of this cause, to be taxed at $—, for which execution may issue, and that the injunction heretofore allowed is hereby made perpetual.

Thereupon came the defendant and prayed for an allowance of appeal to the next term of the Supreme Court of the United States, which appeal is allowed and bond for such appeal is fixed at $500.00.

And thereupon came on to be heard the complainants' motion to increase damages, and upon consideration the same is
427 overruled; and thereupon complainant- prayed an appeal from the decree herein to the next term of the Supreme Court of the United States, which is allowed, and bond for appeal is fixed at $500.00.

428 And afterward, to wit, on the 10th day of July, 1888, there was filed in this court in this cause an appeal bond, which is in the words and figures following, to wit:

Know all men by these presents that we, Isaac N. Topliff, as principal, and W. W. Boynton and John C. Hale, as sureties, are held and firmly bound unto John A. Topliff and George H. Ely in the sum of five hundred ($500.00) dollars; to the payment whereof, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally, firmly by these presents.

Sealed with our seals and dated this 26th day of June, in the year of our Lord one thousand eight hundred and eighty-eight.

Whereas the above-bounden Isaac N. Topliff has appealed to the Supreme Court of the United States from a decree of the circuit court of the United States for the northern district of Ohio, bearing date the 17th day of May, A. D. 1888, in a cause wherein the said John A. Topliff & George H. Ely were complainants and the said Isaac N. Topliff respondent: Now, therefore, the condition of this obligation is such that if the above appellant shall prosecute his appeal with effect and pay all such damages, costs, and expenses as shall be awarded against him as such appellant therein, then this obligation to be void; otherwise to remain in full force and effect.

I. N. TOPLIFF. [SEAL.]
W. W. BOYNTON. [SEAL.]
JOHN C. HALE. [SEAL.]

Sealed and delivered in presence of—

——— ———.

Approved.
M. WELKER, *Judge.*

429 And afterward, to wit, on the 13th day of July, 1888, there was filed in this court in this cause a supersedeas bond, which is in the words and figures following, to wit:

Know all men by these presents that we, Isaac N. Topliff, as principal, and W. W. Boynton and John C. Hale, as sureties, are held and firmly bound unto John A. Topliff and George H. Ely in the full and just sum of seventeen thousand dollars, to be paid to the said John A. Topliff and George H. Ely, their certain attorney, executors, administrators, or assigns; to which payment, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally, by these presents.

Sealed with our seals and dated this eleventh day of July, in the year of our Lord one thousand eight hundred and eighty-eight.

Whereas lately, at the April term, 1888, of the circuit court of the United States for the northern district of Ohio, eastern division, in a suit depending in said court between John A. Topliff and George H. Ely as complainants and said Isaac N. Topliff as defendant, a decree for damages was rendered against the said Isaac N. Topliff for the sum of $8,480.51, and the said Isaac N. Topliff having obtained an allowance for an appeal and to reverse the said decree in the aforesaid suit, and said allowance for an appeal being by law a notice and citing and admonishing them to be and appear at a Supreme Court of the United States to be holden at Washington the second Monday of October next·

430 Now, the condition of the above obligation is such that if the said Isaac N. Topliff shall prosecute his appeal to effect and answer all damages and costs if he fail to make his plea good,

then the above obligation to be void; else to remain in full force and virtue.

I. N. TOPLIFF. [SEAL.]
W. W. BOYNTON. [SEAL.]
JOHN C. HALE. [SEAL.]

Sealed and delivered in presence of—
—— ——.

Approved by—
M. WELKER,
District Judge U. S., said District.

431 And afterwards, on September 25th, 1888, the following appeal bond was filed, to wit:

Know all men by these presents that we, John A. Topliff and George H. Ely, as principals, and Herman Ely and Walter E. Brooks, as sureties, are held and firmly bound unto Isaac N. Topliff in the sum of five hundred ($500.00) dollars; to the payment whereof, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally, firmly by these presents.

Sealed with our seals and dated this 15th day of August, in the year of our Lord one thousand eight hundred and eighty-eight.

Whereas the above-bounden John A. Topliff and George H. Ely have appealed to the Supreme Court of the United States from a decree of the circuit court of the United States for the northern district of Ohio, bearing date the 17th day of May, A. D. 1888, in a cause wherein the said John A. Topliff and George H. Ely were complainants and the said Isaac N. Topliff was respondent: Now, therefore, the condition of this obligation is such that if the above-named appellants prosecute their appeal with effect and pay all damages, costs, and expenses as shall be awarded against them as such appellants therein, then this obligation to be void; otherwise to remain in full force and effect.

JOHN A. TOPLIFF. [SEAL.]
GEORGE H. ELY. [SEAL.]
HERMAN ELY. [SEAL.]
WALTER E. BROOKS. [SEAL.]

Sealed and delivered in presence of—
CHAS. T. ELY.
H. S. SHERMAN.

Approved.
M. WELKER,
District Judge.

432 THE UNITED STATES OF AMERICA, }
Northern District of Ohio, Eastern Division, } *ss:*

I, Augustus J. Ricks, clerk of the circuit court of the United States for said district, do hereby certify the above and foregoing to

be a true, correct, and complete transcript of the record of all the proceedings had in said court in the cause wherein John A. Topliff and George H. Ely are complainants and Isaac N. Topliff is defendant, as the same appears from the files and records of said court now remaining in my custody.

Seal of the Circuit Court, North'n Dist. of Ohio.

In testimony whereof I have hereunto set my hand and affixed the seal of said court, at my office in Cleveland, in said district, on this 25th day of September, A. D. 1888, and of the Independence of the United States of America the 113th year.

AUGUSTUS J. RICKS, *Clerk.*

Endorsed on cover: N. Ohio C. C. U. S. No. 220. Isaac N. Topliff, appellant, *vs.* John A. Topliff and George H. Ely. Filed October 13, 1888. No. 277. John A. Topliff and George H. Ely, appellants, *vs.* Isaac N. Topliff. Filed October 22, 1888.

Office Supreme Court U. S.
FILED,
APR 4 1892
JAMES H. McKENNEY,
CLERK.

IN THE

Supreme Court of the United States.

OCTOBER TERM, 1891.

ISAAC N. TOPLIFF, *Appellant,*
vs.
JOHN A. TOPLIFF AND GEORGE H. ELY, *Appellees,* — No. 220.

JOHN A. TOPLIFF AND GEORGE H. ELY, *Appellants,*
vs.
ISAAC N. TOPLIFF, *Appellee.* — No. 277.

BRIEF IN BEHALF OF JOHN A. TOPLIFF AND GEORGE H. ELY.

HENRY S. SHERMAN,
Solicitor for Topliff & Ely.

THE FORMAN-BASSETT-HATCH CO., CLEVELAND, O.

IN THE

Supreme Court of the United States.

OCTOBER TERM, 1891.

ISAAC N. TOPLIFF,
Appellant,
vs.
JOHN A. TOPLIFF AND GEORGE H. ELY,
Appellees.
APPEAL No. 220.

JOHN A. TOPLIFF AND GEORGE H. ELY,
Appellants,
vs.
ISAAC N. TOPLIFF,
Appellee.
APPEAL No. 277.

BRIEF IN BEHALF OF JOHN A. TOPLIFF AND GEORGE H. ELY.

The bill was filed in this case by John A. Topliff and George H. Ely, complainants, in the Court below, against Isaac N. Topliff, for the infringement of three patents owned by the complainants, and was in the usual form, with a prayer for an account and an injunction. The answer admitted that the defendant had manufactured and

sold the devices shown in the complainants' patents, but alleged that all of complainants' said patents were void, on the ground of want of novelty, and that the reissued patent mentioned in the bill was not for the same invention as the original. The replication was in the usual form.

The cause came on to be heard in the Court below, upon the proofs made, and after argument the Court held that two of the complainants' patents were good and valid in law, and that the defendant was guilty of infringement. An injunction was allowed, issued and served on the defendant, and a master was appointed to take an account of the profits and damages. The parties appeared before the master, testimony was taken and the master in his final report found the sum of $8,480.51 to be due to the complainants from the defendant, as damages for said infringement. Exceptions were filed to the master's report, which exceptions were overruled and a final decree for the above sum was entered.

From this decree the complainants and the defendant each took an appeal to this Court.

The assignments of error by the defendant are found on pages 5 and 6 of his brief in this case.

The assignments of error of the complainants are found on page 75 of this brief, and are discussed in the pages following.

I.

PLEADINGS.

Before discussing the main issues raised by the defendant's appeal, it is proper to advert to the allegations contained in the pleadings and which appear in the record.

The complainants set up in their bill two patents and one reissue which it is charged that the defendant infringes. The bill contains the usual averments of the application for the issue of the several patents, and the surrender and reissue of one of them; that they are susceptible of conjoint use, and that the defendant infringed upon the rights secured to complainants in and by said patents.

The defendant in his answer admits the issue of the patents, but denies the validity thereof, because,

1. The alleged inventions described in the several patents mentioned in the bill were publicly known and used by divers parties in the United States for more than two years prior to the date of the respective applications.

These averments, under Section 4920, U. S. Revised Statutes, are not sufficient to found any testimony on, but as the defendant has not offered any proof at all as to prior use and has not assigned this as one of the grounds of error, it is not necessary for us to consider these allegations.

2. That the patentees named in the several patents in controversy were not severally the original and first inventors of the devices claimed in the several patents.

This allegation, as a defense, concedes that the several patentees are true inventors of the several articles in question, described in the several patents, but denies that they severally were the *first* inventors of the thing covered by the patent. 3 Rob. on Pats., Sec. 961. It will not be claimed that there is any proof at all in the record to support this allegation, nor, strictly speaking, is this point assigned for error by the defendant.

3. That the application for the original patent granted to Topliff & Ely, December 19th, 1871, of which the reissue is in controversy, was rejected in November, 1871, for want of novelty in view of prior inventions.

There is not a syllable of proof in the record on this subject, but it does appear affirmatively on the face of the original patent that it was issued to Topliff & Ely in the December following, and the patent when issued is at least *prima facie* evidence that it covered a novel article. This point is not assigned for error by the defendant.

4. That none of the alleged several inventions were new when the several patents were granted.

We assume by this that the defendant intended to defend against these patents on the ground of want of novelty, either because of prior use, prior patent, or prior publication. We have already stated, and the record will confirm our statement, that there is not a syllable of testimony tending to show any prior *use* of the articles or things described in any of the patents in controversy, nor

is it alleged in the answer, or shown in the proof, that any of the patents in controversy are covered by prior publications. The answer does affirmatively allege (record, page 11) that all of the inventions shown in the several patents named in the bill of complaint are set forth and described in six anticipating patents, the names of the patentees of which, and the numbers and dates of the patents are given in the answer.

5. That the Topliff and Ely reissue named in the bill of complaint is for a different invention from that covered by the original patent to Topliff & Ely.

This allegation raises a question which is to be solved, not by the introduction of any testimony or other proof outside of the original and reissued patents, but is to be decided by the Court solely upon a comparison of the original and the reissue. This point will be discussed in its proper order later in this brief.

6. As we have already said, the answer plainly admits the manufacture and sale by the defendant, of the articles described and claimed in these patents, and the defendant in his proofs admits his infringement of the patents if they are valid.

From the foregoing analysis of the pleading, we see that the real issues made by the parties are of a two-fold character; they involve:

First—The validity of each of the patents in controversy, for want of novelty; and

SECOND—The validity of the Topliff & Ely reissue, on the ground that it is for a different invention from that described and claimed in the original patent.

II.

COMPLAINANTS' PATENTS.

We think it further proper at this point to state somewhat in detail the nature, character and scope of the several patents which are in controversy in this suit; and hereafter in this brief we shall describe the three patents in controversy as the "Augur Patent," the "Topliff Reissue" and the "Saladee Patent."

1. *Augur Patent.* The first patent mentioned in the complainants' bill is the patent granted to John B. Augur, on October 11th, 1870, No. 108,085, which is a patent for "an improvement in gearing for buggies." The first two claims of this patent are the only ones here in issue, and are as follows (record, page 17):

1. The herein described method of equalizing the action of springs of vehicles and distributing the weight of the load.

2. The combination of the pivoted links with a rod connecting the same, the rod compelling both links to move in unison, as and for the purpose described.

The patentee more particularly describes his invention in his specifications, as follows:

"My improvements consist, first, in connecting

together by a rigid rod, the two pivoted links upon the clips employed on the hind axle, so that when the weight is upon one spring, both springs, by reason of the connecting-rod, shall be caused to work together, thus preventing the roll."

The other improvements described are immaterial in this case.

The patentee further describes this part of his invention as follows:

"The rod G is turned down at each end to pass through the eyes of the links and through the clips, and is threaded at each extreme end to receive a nut *g*. This rod turns in its bearings in the clips, the links having square or equivalent openings in their eyes to receive a correspondingly shaped portion of the rod. This insures a positive rocking of the rod upon its axis whenever either link is swung forward or back by the action of its own spring and positively compels (through the agency of the rod) the simultaneous and equal movement, and with positiveness, of both links, and as a consequence an equal action of both springs of the vehicle, even though all the weight may be upon one side. In short, one spring cannot act without forcing the same action upon the other and hence the weight is brought to bear on both ends of the axle. Anything like a roll is prevented and there is no undue straining or contorting of the springs, axle or any other parts."

In this patent, the device described consists of a rod clipped or attached to the hind axle of the vehicle, having two links which are rigidly attached to the rod, one at each end thereof, projecting upwardly, to which the rear end of each of the side springs of the buggy is piv-

oted. The result is that when one spring is depressed, as for instance, when a person is stepping into the vehicle on one side, the other spring is also depressed through the action of the rigid rod connecting with the other spring, so that the body of the vehicle is constantly kept upon an approximate level.

The first claim of this patent covers broadly, this method (or more properly, this *means*) of equalizing the action of the springs of vehicles, and distributing the weight of the load.

The second claim is limited to the combination of the pivoted links with the rigid rod connecting the same, for the purpose of thus equalizing the action of the springs.

This patent is dated October 11th, 1870, and is *first in order of date* of the three patents mentioned in the bill.

2. *Topliff & Ely reissue.* This reissue is dated March 28th, 1876, and is a reissue of the original patent granted to Topliff and Ely on December 19th, 1871. The reissue contains two claims, as follows: (Record p. 33.)

"1. The combination of two connecting-rods located at the front and rear ends of a wagon-body, and arranged to turn in their bearings, with a pair of half-elliptic springs, whereby the springs are caused to yield in unison with each other, substantially as and for the purpose set forth.

2. The combination of the connecting-rods, B B provided with arms at their ends, with the half-elliptic springs, A A substantially as and for the purpose set forth."

This reissue is fully discussed later on in this brief.

3. *Saladee Patent.* The third patent in point of date, set up in the complainants' bill, is the patent granted to Cyrus W. Saladee, No. 123,937, and dated February 20th, 1872. The Court below, in its decree, failed to pass upon this patent at all, and we assume, for the purpose of this appeal, that such failure by the Court to construe or otherwise pass upon the validity of the patent is, in effect, a holding that the patent is invalid. Neither party has assigned this omission of the Court as error, and it is not necessary, therefore, that any discussion should be had upon it.

When, therefore, we discuss the patents in suit, in this brief, we shall limit ourselves to a discussion of the Augur patent and Topliff patent alone, and make no further reference to the Saladee patent.

III.

STATE OF THE ART.

It is claimed by the defendant below, that there is such lack of patentable novelty in the inventions described in the patents in suit, as to render them, for that reason, invalid, and the state of the art is appealed to by the defendant to substantiate his position.

Prior to the inventions described in the patents in suit, it is true that the equalization of springs, by various devices, was known, but this equalization was accom-

plished in all cases, by complicated mechanism, consisting of coiled springs, straps and pulleys. It will be seen, by an examination of the prior patents set up in the answer, and introduced as evidence by the defendant, and which will be discussed at length hereafter, that at the date of the patents in suit, the equalization of side springs in vehicles, by means of a single or twin connecting rods, attached directly to the springs, and without the interposition of any other mechanism, was not known in the art, and that, so far as this feature of the patents is concerned, the inventions disclosed in the patents in suit occupy a field by themselves.

In considering these anticipating patents, then, it is necessary to bear in mind, the fact, as shown by the testimony, that the real invention which Augur and Topliff and Ely made, and to which the claims in controversy of the patents in suit relate, consists in providing new means of equalizing the action of the springs of a wagon, and differs essentially from any means before known, and is of very great utility and value.

We next desire to direct the attention of the Court to the claim made in the answer of the defendant, that the inventions disclosed in the patents in controversy were not inventions, when produced by the patentees, and that they are void, for want of novelty.

The defendant, in his answer and in his testimony,

has offered several patents, covering inventions which, as he alleges, anticipate the inventions disclosed in the patents in suit, and render each and all of them void, for want of novelty.

The Court will bear in mind that the inventions disclosed in the patents in suit, consist of certain elements which, though old in themselves, are brought together in a new combination, and produce a useful result in a new way, not before known.

The Court will also bear in mind that the main object of the improvements described and claimed in the patents in suit, is to equalize the action of the side springs of a vehicle, and the sole means by which this is accomplished, is by the use of a rigid rod, operating as a *shaft* to transmit motion. None of the patents disclosed by the defendant, in his answer, illustrate, describe or suggest a method of equalizing springs, confined *solely to the employment of a shaft or rigid rod to transmit the motion of one spring to another.*

This is the feature of the invention shown in the patents in suit, which distinguishes them from all other methods of equalization known or used prior to these inventions.

IV.

PRIOR PATENTS.

Taking up, now, the prior patents set forth in the defendant's answer, we find :

1. The patent of *Jones, Eells & Griswold*, July 16th,

1838, No. 842, is named in the answer as an anticipating patent, but was not offered in evidence and is not in the record, and that patent need not therefore be considered.

2. The same remarks may be made of the patent of *A. C. Stowe*, dated December 22d, 1868, No. 85,144.

3. The same remarks will apply to the patent of *Benjamin Hershey*, dated August 29th, 1871, No. 118,452.

4. The patent of *A. C. Stowe*, dated November 24th, 1868, No. 84316, is found on page 72 (Printed Record). This patent covers a combination device, some of the material elements of which are wholly wanting, in both the Augur and Topliff devices, i. e., "two shafts EE each of which is provided with three corresponding cranks, one *g* in the middle, and one *d* at each end," also the "connecting bar or rod C, together with the links *ee* and rods *b*," all of which are claimed in combination, in the claim of the Stowe patent. It will be further noticed that the springs in this patent are not hinged to the crank bar as in the complainants' device, they are hinged directly to the rigid rod, nor are the functions of the different parts the same, nor are they performed in the same way, as is very clearly seen by an inspection of the drawings. The Stowe device, in its mechanism, is wholly different from either of the inventions disclosed in the patents in suit, and it does not and can not accomplish the result accomplished by the complainants' devices, hence

it wholly lacks the main features of either of the complainants' patents.

5. The patent of *C. M. Sexton*, No. 81,217, dated August 18th, 1868, is found on page 73 of the Printed Record. It is sufficient to say of this device that the equalization of the springs, if the device is at all operative, is effected by means of straps, pulleys, hangers and rods—a very complicated device containing many elements in its combination which are not found in either of the complainants' devices, all of them performing different functions in a different way from any of the few elements of the complainants' devices. In no sense can it be said that this combination is the combination shown in either the Augur or Topliff patents.

No attempt is made by the defendant below, in his record evidence, to show that any of these patents anticipate the inventions of Augur or Topliff, and therefore we need give them no further attention.

6. The patent of *Stringfellow & Surles*, dated January 15th, 1861, No. 31,134, is found on page 70, Printed Record, and is the patent upon which defendant relies to show want of novelty in the inventions disclosed in the patents in suit.

To this patent, then, the attention of the Court is particularly called, and if it be found that this invention is not the invention shown in either the Augur or the Topliff patent, and cannot be construed to anticipate

either of them, then the novelty of the Augur and Topliff patents must be recognized and the decree of the Court below on this point affirmed.

This patent is stated to be for "a novel improvement in hanging carriage bodies, from springs and from C-shaped jacks or supports, whereby the body is allowed a free and easy vibration longitudinally, and it is relieved from sudden and disagreeable jolts and jerks in traveling on rough roads or from the sudden starting of the horse."

The patentee further states:

"The invention consists in the combination of transverse tie rods with the side springs, which are hung by shackle bars or jointed links from C-shaped supports, as will be hereinafter fully explained."

Then follows the specification, and as the defendant's counsel lays so much stress upon this patent, we quote it in full:

"A A are the bolsters and B B are the perches of an ordinary buggy frame. C C are two front C shaped iron loops or supports which are securely bolted to the side perches and over the bolster at the points where the bolster is connected with the perches, and C' C' are two rear C-shaped loops which are similar to loops C C and similarly secured to the rear part of the frame.

"These C-shaped loops C C and C' C' are not springs, but serve as supports for the springs D D and the parts which are attached to and mounted on these springs D D.

"On the overhanging end of each loop support C and C' is formed a transverse eye *a* which will be seen by reference to Fig. 2 of the drawings, through which eyes *a a a a*, bolts *b b b b* are passed, which connect the upper

ends of the *shackle bars* E E E E to the ends of the aforesaid loops and form joints which will allow the *lower ends of bars E to swing back and forth in a direction with the length of the vehicle.* The lower end of the swinging bars E (these bars being all of the same length) are jointed to the ends of the semi-elliptic springs D D by means of eyes *c c c c* on the springs, and bolts *d d d d* in a similar manner to the joints of the bars E E with the supports C C'.

"The two springs D D on which the body of the vehicle rests are thus suspended over the frame AB from the overhanging ends of the stationary suppports C C, C' C', and these springs extend from the front to the rear supports on each side of the carriage body over the perches B B and a suitable distance above these perches.

"It will thus be seen that the springs D D are suspended in such a manner from the four supports C C C' C' that *the body of the carriage*, which is mounted on said springs, *will be allowed to have a free, swinging motion backwards or forwards*, and in consequence of the springs being hung by the shackle bars EEEE the springs will also have an upward movement; in other words, the end of the springs in their longitudinal movement will describe circles concentric with the axis of their respective bolts *bbbb*. The longitudinal movement of the two springs DD will therefore be regulated by the length of the shackle bars E from joint to joint.

"In uniting the shackle bars to the ends of the springs DD and the supports C C C' C', *two tie bars GG with forked ends*, one of which is shown in figure 2 of the drawing, are used *for the purpose of bracing the supports C C' and also the ends of the springs* DD, so as to prevent the swaying of the carriage body from *twisting or bending the supports C C laterally.* The forked arms *gg* of these tie bars GG have eyes formed on their ends, and the

length of the bars G is exactly equal to the spaces between the ends of the eyes *aaaa*, so that when the bars are properly put in place their eyes will receive the bolts *bbbb* and the bolts *dddd*, and by means of these bolts and bars G are securely attached at the points of the supports C C' and to the end springs DD, so as to move with the shackle bars E and *serve as lateral braces* or *ties for the springs D D and the supports C C C' C'*.

"From this description it will be seen that when a load is put upon the two side springs DD, the four shackle bars EEEE will hang perpendicularly over the bolsters or axles, and that when the vehicle is moving over rough roads *the shackle bars will allow the body of the carriage to have a free and easy swinging motion*, which will counteract all unpleasant and injurious jars to the carriage body and carriage parts. At the same time the long springs DD will allow the carriage body to have an easy elastic motion.

"We are aware that side springs have been used attached at their ends to the ends of C formed springs or rigid or stiff supports, by means of jointed links, so that the carriage body will have a longitudinal motion of the side springs, and we do not claim such as our invention.

"But what *we do claim as new*, and desire to secure by letters patent is:

"*The transverse ties G G, arranged and operating substantially as and for the purposes specified.*"

In this patent, the springs are united by shackle bars or jointed links, which are not rigidly formed or attached to any connecting rod. These joints are used "to allow the lower ends of the bars to swing back and forth in the direction of the length of the vehicle," and the springs are jointed to the lower ends of the bars in a

similar manner, so as to produce "the free swinging motion backwards and forwards." The shackle bars or jointed links are *connected by means of a tie bar or brace*, having forked ends, the purpose and function of which is stated in the patent as follows, to-wit :

"*Two tie bars are used for the purpose of bracing the supports CC and also the ends of the springs DD, so as to prevent the swaying of the carriage body from twisting the supports CC laterally.*"

Also, "they serve as lateral braces or ties for the springs and the supports."

The specifications require the shackle bars "to hang perpendicularly over the bolsters or axles," so as to allow —as the patentees say—"the body of the carriage to have a free, easy swinging motion."

The claim is as follows :

"The transverse ties GG arranged and operating substantially as and for the purposes specified," and the *only purpose specified, for which these transverse ties are used*, is to *brace the C shaped supports*, and also the ends of the springs, so as to prevent the *twisting or bending of the supports laterally.*

Now it is clear, by reference to this description, that the patentees had in view and claimed, not a combination of elements by means of which the equalization of the action of the springs was obtained, but *simply a transverse tie bar, for the purpose of laterally bracing the supports, and nothing else ;* and nowhere in the drawings or

specifications of the claim, is any device described or claimed as intended for, or to be used to *equalize the action of the springs.*

It is true, in respect to all of these patents which the defendant has set up as anticipating the several inventions of Augur and Topliff, that neither in those prior patents themselves, nor in the structures described in them, can any one find any suggestion of the particular devices shown in the patents in controversy, by which the motion of one spring is transmitted through a rigid rod to the other spring, nor is there any proof in this case, that any of those prior structures was ever used for the purposes shown in the patents in controversy. The mechanism of the Augur and Topliff patents is wholly different from that of any equalizing devices shown in any of those prior patents. The construction and operation are different from those of any of the prior devices, and this operation is demonstrably due to the differences in mechanism, so that we may say there is nothing in any one of the prior exhibits, which suggests the construction, or mode of operation adopted by Augur and Topliff and described in their respective patents. A careful analysis of the testimony of the defendant's witnesses, including their cross examination, makes it perfectly clear that the equalizing devices disclosed and claimed in the patents in controversy are not to be found in any prior structures or prior patents offered in evidence by the defendant. It is true that

some of the defendant's witnesses say that they found in the defendant's model of the Stringfellow device (Exhibit B) the "*principle*" which underlies the patents in controversy, but when these witnesses are brought face to face with the specifications, claim and drawings of the Surles & Stringfellow patent, and are asked to state where, either in the drawings, specifications or claim, there is anything suggested, disclosed, shown or claimed, whereby the springs of a wagon are equalized, they are obliged to testify that there is nothing, nor can they find in that patent any structure having in combination the mechanical equivalents of the parts shown in the Augur and Topliff patents, which produce the same result by the same means and in the same way as in the patents in controversy.

Such was the state of the art when Augur and Topliff made their respective inventions, and it is perfectly apparent that there is nothing in the art thus shown, which requires the claims of these patents in controversy to be construed so as to deprive the complainants of the benefit of their inventions.

In construing the different claims of these different patents in controversy, the complainants are entitled to a broad and liberal interpretation of them. The record clearly shows that Augur was undoubtedly the first in the art to make a *practical equalizer, which would simply and successfully accomplish the results described.* It is a

significant fact, worthy of the attention of the Court, that the defendant neither heard, nor knew of any equalizers until he entered the employ of the complainants, and that as soon as he left their employ, to engage in the manufacture himself, he adopted, as he admits in his answer and in his testimony, an equalizer of *the identical construction of that used by the complainants.*

The inventor, who is the first to make a successful machine to accomplish a certain purpose, is entitled to a liberal construction of his invention and patent.

Davis vs. Brown, 19 Blatch. 263.

Merrill vs. Yeomans, 94 U. S. 566.

Winans vs. Denmead, 5 Howard, 33.

Rubber Co. vs. Goodyear, 9 Wall., 788.

In the last case above cited, the Court say:

"But liberality, rather than strictness, should prevail where the fate of the patent is involved, and the question to be decided is whether the inventor shall hold or lose the fruits of his genius. The rule of *ut res magis valeat quam pereat* should be applied."

Coffin vs. Ogden, 18 Wall., 120.

V.

WANT OF NOVELTY IS A QUESTION OF FACT, AND THE BURDEN OF PROOF RESTS ON THE DEFENDANT.

The question as to whether or not there is want of novelty in the inventions in controversy is one purely of fact. This is true when the prior thing which is set up as anticipating the patents in suit, is itself a patent; and

this question is to be determined, not by any construction to be given by the Court to the prior patent, but by the evidence of the case, and the burden of proof is on the defendant.

Walker on Pats. secs. 75, 76.

Battin vs. Taggert, 17 Howard, 74.

Turrill vs. R. R. Co., 1 Wall. 491.

The question arose, in the case of Bischoff vs. Withered, 9 Wall. 812, as to whether this was true in respect to a prior patent, and the Court held :

"That the question whether novelty in a patent is negatived by a prior patent is not a question of construction, but a question of fact. This being true, the question of fact thus raised must be proved by him who avers it, and every reasonable doubt should be resolved against him; that is, proof is required which will put the fact beyond a reasonable doubt, and a patent enjoys the *same presumption of novelty that an unconvicted criminal does of innocence.*"

In the case of Coffin vs. Ogden, 18 Wall., 120, the Court say :

"An invention or discovery relied upon as a defense must have been complete and capable of producing the results sought to be accomplished, and it must be so shown by the defendant. The burden of proof rests upon him, *and every reasonable doubt should be resolved against him.*"

In Shirley vs Sanderson, 8 Fed. Rep., 903, the Court say :

"The burden of proof is on the defendant to establish affirmatively the want of novelty, *beyond a reasonable doubt.*"

In Webster Loom Co. vs. Higgins, 4 B. & A., 88, Judge Wheeler says:

"The burden of proof rests upon the defendant to show *beyond a fair doubt* the prior knowledge and use set up."

See also Walker on Pats., Sec. 76.

Cantrell vs. Wallick, 117 U. S., 695.

Smith vs. Goodyear, 93 U. S., 436.

Lehnbeuter vs. Holthaus, 105 U. S., 94.

The Court, in the case at bar, must be convinced *beyond a reasonable doubt* that one or more of the patents introduced in evidence in this suit describes a structure or structures identical with that of the structure shown by the complainants' patents in controversy, before the Court can declare the Augur and Topliff patents, or either of them, void for want of novelty.

VI.

WANT OF NOVELTY.

Coming now to the questions of fact involved in this defense, let us see what kind and character of proof is admissible to show that degree of want of novelty in a patented invention which is sufficient to establish such defense and defeat the patents in controversy.

1. A prior patent cannot be used for the purpose of defeating the patent in suit, unless it contains such full and precise information as will enable a person skilled in the art to which it relates to make or construct the thing covered by the patent in suit, which it seeks to anticipate.

Walker on Pats., Sec. 57, and authorities there cited.

In Seymour vs. Osborne, 11 Wall, 516, the Court says:

"Patented inventions cannot be superseded by the mere introduction of a foreign publication of the kind, though of prior date, unless the description and drawings contain and exhibit a substantial representation of the patented improvement in such full, clear and exact terms as to enable any person skilled in the art or use to which it appertains to make, construct, and practice the invention to the same practical extent as they would be enabled to do if the information was derived from a prior patent."

This doctrine is affirmed in a later case—Cohen vs. Corset Co., 93 U. S., 366, where the Court say:

"It must be admitted that unless the earlier patented and published description does exhibit the later patented invention *in such full and intelligible manner as to enable persons skilled in the art to which the invention is related, to comprehend it without the assistance of the patent, or to make or repeat the process claimed, it is insufficient to invalidate the patent.*"

See also Downton vs. Yeager Miller Co., 108 U. S., 471.

Applying this doctrine to the case at bar, it is perfectly evident that none of the prior patents offered in evidence contain such full and precise information as would enable any person skilled in the art to make the equalizer described and claimed in either of the patents in controversy. Take the Stowe, Sexton and Stringfellow patents, which are the only ones offered in evidence, to show anticipation of the complainants' patents. It is admitted by the defendant's counsel that the only pertinency of the Stowe and the Sexton patents above named is to show that the equaiization of

springs had been made the subject of patents, that is to say, that there *was a prior art on this subject*. It will not for a moment be claimed by the defendant's counsel that either of these patents shows any structure that would in any sense anticipate that of the Augur or Topliff patents. This, then, leaves the Stringfellow patent as the only prior patent on which the claim of anticipation is or can be founded, and this is plainly admitted by the defendant's counsel.

The contention of the defendant is that the model of the Stringfellow device (Exhibit B) which the defendant himself constructed for the purposes of this suit and has offered in evidence as disclosing the structure described and claimed in the Stringfellow patent, *is the anticipating thing*. This, of course, is not true. In his answer the defendant alleges that the invention of Augur is shown and described in the Stringfellow *patent*, and it is the *patent itself* which is set up as the anticipation, and the Court must therefore look to the patent, *its drawings, specifications and claims*, as a whole, and not to the *model* which the defendant has seen fit to offer in evidence; and the Court, upon a fair construction of this *patent*, including the drawings, specifications and claims thereof, must say whether *that patent* does in fact disclose such full and precise information as would enable one skilled in that particular branch of manufacture or art, to make and use the thing covered by the patents in suit, which is seeks to anticipate. In other words, before any anticipation is made out, the Court must

find that the Stringfellow patent, *in and of itself*, affords such precise information to a mechanic, as would have enabled him, at the date of that patent in 1861, to construct the identical equalizer of Augur or that of Topliff. If the mind of the Court is not convinced of this fact beyond a reasonable doubt, then the Stringfellow patent does not anticipate the Augur or the Topliff patent.

It is, of course, a very easy thing for a mechanic, after Augur had made his invention and disclosed it, to say that the "*principle*" of the Augur device is now to be seen in the Stringfellow device, and yet it fully appears in evidence that more than ten years elapsed after the patent was published before any mechanic did discover how to construct the Augur or Topliff device. Stringfellow himself never recognized it, and never claimed any equalizing feature in it. It took more than twenty years for *the defendant* to find such feature in it.

All the witnesses in behalf of the defendant, including the defendant himself, when their attention was called to the *patent itself* testified that no *equalizing device* is shown or claimed in that patent.

Mr. Warner, upon whose testimony the defendant's counsel lays the greatest stress, admits (Record, page 53) when asked what he found in the Stringfellow *patent*, which showed any device for equalizing the motion of the springs, said: "*I find nothing. He evidently builded wiser than he knew.*"

Does such proof as this satisfy the mind of the Court beyond a reasonable doubt, that the Stringfellow patent exhibits the complete and identical invention of Augur, "in such full and intelligible manner as to enable persons skilled in the art to which the invention is related, to comprehend and construct the Augur equalizer, without the assistance of the Augur patent?" If not, then the Stringfellow patent does not anticipate and invalidate the Augur patent.

2. In order to invalidate a patent for an alleged want of novelty, the structure shown in the alleged anticipating patent must be *substantially identical* with that covered by the later patent, for if a substantial difference exists between them, this defense must fail.

See Walker on Pats. sec. 62 and authorities there cited.

On comparing the Stringfellow device, as described, shown and claimed in the *patent itself*, with the devices shown and claimed in the Augur and Topliff patents, it is perfectly evident that there is no identity between the devices. It is evident, from the Stringfellow patent, that the whole invention, as it existed in Stringfellow's mind, and as it was afterwards disclosed in his patent, *was a tie-bar or brace*, to prevent the twisting or bending of the C-shaped supports. The defendant's witnesses admit this. The patentee, Stringfellow, and the defendant's witnesses being thus of one mind on this point, is it possible that this Court will say that the two things, thus admitted to be different, are identically the same?

3. Want of novelty cannot be shown by anything that is fundamentally incapable of the function of the thing covered by the complainants' patents, even though the character of the prior structure is mechanically similar thereto.

Walker on Pats., sec. 65, and authorities there cited.

No argument is necessary to show that the function of the Augur and Topliff devices is the equalization of the springs. It is equally clear that the Stringfellow device, as disclosed and claimed in that patent, is fundamentally incapable of the function of the complainants' device, to wit: —the equalization of the springs, or rather, transmitting motion from one spring to another. This is clearly shown in the full sized model of the Stringfellow patent (complainant's exhibit O).

4. The fact that each one of the elements of a combination patent is old will not defeat the patent.

Bates vs. Coe, 98 U. S., 48.

Imhaeuser vs Buerk, 101 U. S., 660.

Parker vs. Booth, 102 U. S., 104.

5. Want of novelty cannot be shown by a device or structure which was *neither designed, nor apparently adapted, nor actually used to perform the function of the thing covered by the patent, though it might have been made to perform that function by means not substantially different from that of the patented invention.*

Clough vs. Baker, 106 U. S., 166.

Telephone Cases, 126 U. S.

The specifications, drawings and claim in the Stringfellow patent clearly show that such device was *never designed* to perform the function of complainants' combination, to wit: the transmission of the motion of one spring to the other. The patent clearly shows that it never was *apparently adapted to perform that function*, as is illustrated by the full-sized model, exhibit O, and the defendant and his witnesses have testified that it never *was actually used for that purpose*.

6. Where the relative positions of the parts of a machine or device are changed, and such change so changes the function of the parts, that the machine or device acquires a substantially different mode of operation, even though the result of the machine remains the same, this does not show want of novelty.

15 Howard, 221.

In the Stringfellow patent, the links hang perpendicularly from the supports, and are loose links or "shackle bars." In the complainants' patents, the form and position of the rod and arms are different, and the arms are made rigid instead of loose, and are held at a nearly horizontal, instead of perpendicular position. That thus changing the form of the rod and the position of the links does change the function and operation of these parts, the testimony of the experts in this case clearly shows.

7. A combination is an entirety. If one element is

omitted, the thing claimed disappears. Every part of a combination claim is conclusively presumed to be material to the combination, and no evidence to the contrary is admissible, in case of alleged infringement. A patentee makes all the parts of the combination material, when he claims them in combination and not separately. It is not necessary to cite the authorities on these recognized principles of patent law.

Now, assuming that the Stringfellow device is a combination, the elements of a *crank pin* and *loose shackles* are material elements. The complainants use neither, and therefore would not infringe, if Stringfellow should sue them. If the Stringfellow device is simply, as Stringfellow in his patent clearly claims, a *brace* to prevent the twisting or bending of the supports, the complainants, in their combination, do not use it.

8. An accidental or incidental effect, not observed if it existed, has also been held not to show prior invention.

Walker on Pats. sec. 67.

Maxheimer vs. Myer, 20 Blatch., 19.

Andrews vs. Carmen, 13 Blatch., 323.

Clough vs. Barker, 106 U. S., 166.

Ransom vs. New York, 1st Fisher, 265.

In the Stringfellow device, an equalizing motion, if there be any, is an accidental effect and the existence of it in that device was *neither designed nor observed by the patentee.* This is clearly shown by the terms of the speci-

fications, and claim of that patent. The testimony also shows that the existence of that effect was *never observed by any other person subsequent to the issue of that patent until it was introduced in evidence here.*

VII.

Topliff Patent not anticipated by Augur Patent.

Again, it is claimed that the Topliff patent is invalid, for want of novelty, because anticipated by the Augur patent. This raises a question of fact, and not of law, as we have already seen in discussing the question of want of novelty, based on the Stringfellow patent. The burden of proof on this question is, as on the other, upon the defendant, and the proof must be of that weight, character and sufficiency which will leave no reasonable doubt in the mind of the Court.

All that has ever been claimed for the Topliff & Ely patent is that the device disclosed and claimed in this patent is a *patentable improvement upon the Augur patent.*

This is what Topliff & Ely claim in their patent, as is clearly shown by their reference therein to the Augur patent. They refer to it in their specifications, in the following terms: (Record p. 32.)

"And finally, the last case we cite is the patent granted to John B. Augur, No. 108,085, and dated the 11th day of October, 1870. In this patent, side springs are used the front ends of which are hinged upon fixed and rigid standards secured upon the top of the front bolster,

and where the front ends of the spring are firmly held in a central position over said bolster, while the rear ends are hinged to hinges secured to the outer end of a single connecting rod, placed over the top of the rear axle, in such a manner that, as the springs are lengthened by depression, a corresponding rotation is imparted to the connecting rod. In this case provision for the lengthening of the springs, when depressed or in motion, is only made for the rear ends of the springs, the front ends being firmly held over the center of the bolster, and hence, as the load upon the springs is increased, and as only their rear ends, in combination with said links and connecting rod, are permitted to accommodate their depression, the rear end of the body is caused to have a backward tipping motion, that is, the back end of the body is thrown lower than the front, when the springs are depressed in their full capacity, which is an objectionable feature in this device for equalizing the action of the springs. Besides, as only the rear ends of the springs are allowed to act, that easy and natural motion of the springs, which is only had by allowing both ends to act freely, is in a great measure lost. The radical difference of our invention from each and all of the cases above cited, is, first, in the construction of the connecting rod, and secondly, in suspending both ends of the springs upon separate connecting rods, and thus allow both ends of the springs to act freely and in harmony with their vibrating motion, to which is added the other important advantage, viz: that our arrangement of our connecting rods admits of their application to side spring vehicles of the ordinary kind now in use, as readily as to those built exactly for the purpose—an advantage not attained by any other previously known combination of connecting rods with the springs or bodies of vehicles."

The objectionable results arising from the Augur patent are here shown. They are results which arise out of

the device itself, results which were likely to render the device of doubtful or limited utility. The problem as to how these objectionable results were to be overcome presented itself to those interested in this business and was first solved by Topliff & Ely, by making such changes in the arrangement and construction of the elements of the combination as were necessary to produce the new result. The problem was solved, not as claimed by the defendant, *by a mere duplication of the Augur rod.* If that were all, it would be clear that the Topliff patent could not stand; nor would this mere duplication of the rod, that is to say, the placing of one rod at each end of the wagon body, overcome the difficulty which was presented, for it can readily be seen that the two rods with arms arranged perpendicularly, as shown in the Augur device, would not and could not operate at all, for they could not be held in that position, and, in consequence, the rods would utterly fail to operate. And it further can be readily seen that the Augur rod, with its perpendicular link at each end thereof, its side springs hinged *to a rigid standard in front*, was capable of use only on a vehicle *specially constructed for it*, and the problem which was presented to Topliff & Ely, and which by their improved device they solved, was to construct an equalizing device which would *admit of application to any ordinary side spring vehicle.*

The Augur patent is confessedly for a combination. The claim is for the "herein described method," which

word is used in the sense of "means," that is, the "herein described means," which, on reference to the specifications is shown to be the *rigid standard on the front bolster, the side springs, the rod hinged to the rear axle, and the perpendicular links rigidly formed on each end of the rod*, all combined as described.

The Augur device, as we have already shown, was a great step in advance in the art of equalizing carriage springs, but, as already appears also, it was only applicable to *vehicles specially constructed for its use.*

In the Topliff & Ely improvement, on the other hand, is shown another decided step in the art, in advance of what had gone before. Topliff & Ely sought to produce, as we have before stated, a device *applicable to all side spring vechicles.* Topliff & Ely took, not the combination of Augur, but only one element of that combination. They abandoned *the rigid standard on the front bolster*, which was an essential element of that patent and substituted therefor, a rod. They thus, it is true, duplicated the rod in their device, but they also substituted this rod for the rigid standard in front and at each end of these two rods, they substituted two horizontal, or nearly horizontal arms, in the place of the single perpendicular link of Augur, and this new combination or arrangement of old elements, in its operation and in the results produced, made a device which, instead of being applicable only to wagons specially constructed for it, *became applicable to every side spring vehicle*

in ordinary use. This was a decided improvement over all old devices, and though perhaps not involving invention of the highest order, it nevertheless did involve some invention as we shall show hereafter.

The results produced by this simple and decidedly practical improvement did, as Topliff & Ely say in their patent, give "*an advantage not attained by any other previously known combination of connecting rods with the springs or bodies of vehicles,*" and if, as we think we shall hereafter be able to show, it did involve some invention, it became, in the eye of the patent law, a patentable improvement.

In Cantrell vs Wallick, 117 U. S. 694, this Court says:

"Changes in the construction of an old machine, which increase its usefulness, are patentable. So, *a new combination of known devices, whereby the effectiveness of a machine is increased, may be the subject of a patent. Two patents may both be valid, when the second is an improvement on the first.* * * * Therefore, letters patent for an improvement on a patented invention cannot be declared void because they include such patented invention. Much less does it lie in the mouth of a party who is infringing both the improvement and the original invention, to set up the existence of the first patent as an excuse for infringing the improvement."

VIII.

WANT OF INVENTION.

The defendant's counsel contends that, in addition to the fact that the Augur and the Topliff patents have been anticipated, and are therefore void for want of novelty,

both of these patents are void for want of invention; that the Augur patent is void for want of invention, in view of the prior art, and especially in view of the Stringfellow patent; that the Topliff patent is void for want of invention, in view of the Augur patent.

This defense has not been pleaded in the answer, and is now raised for the first time. If the Court can entertain this defense, in the absence of any pleading, then we say, first, want of invention *is a question of fact, and not of law;* and secondly, *the burden of proving such fact is upon him who alleges it.*

The authorities lay down no exact rule by which this question of lack of invention can be determined. The ideal line which separates things invented from things otherwise produced has never been completely defined or described. There is thus no affirmative rule by which to determine the presence or absence of invention in every case. If a particular result is sought for, want of invention cannot be predicated of a device which first reached that result, on the ground that *the simplicity of the means is so marked that many believed they could readily have produced it, if required.*

Loom Co. vs. Higgins, 105 U. S., 591.

Wicks vs. Ostrum, 103 U. S., 461.

Cantrell vs. Walker, 117 U. S., 689.

In the case of Palmer vs. Johnson, 34 Fed. Rep. 336, the patent was for a sash balance, the construction of which

was but a slight departure from the prior art, and yet the patent was sustained by Wallace, J., who said :

"Cowell's improvement was a very simple one, and it is easy to assert now, that any competent mechanic in that department of industry could have made it by the exercise of ordinary mechanical skill. Indeed, it seems surprising now, that no one had made it; but no one had, although many kinds of pulley boxes had been made, and some had been patented; and, as soon as this one had been made and introduced, its advantages were manifest, and it commended itself to the public as a practical and desirable device, and a better one than those which had preceded it. *These circumstances afford a safer criterion of inventive novelty than any subsequent opinion of an expert, or intution of a judge.*"

In McFarland vs. Spencer, 23 Fed. Rep. 151, the Court held a patent valid, which contained a claim for a simple metal tenon for blind slats, and in sustaining this claim, Judge Coxe said :

"The device is an exceedingly simple and unpretending one,—so simple that, to one who sees it now, the wonder is that it did not occur to some one long before the date of the patent. But it never did. *Criticism that an invention is so plain that it must be perceived by all, comes with poor grace from those who did not themselves perceive it.*"

And in the case of Johnson vs. R. R Co., 33 Fed. Rep., 501, Judge Coxe said :

"In judging of the invention, care should be taken not to under-estimate its value, because the apparatus, now that we have seen it work, seems so plain and simple. The test to which this patent has been subjected—the test which is usually applied to all contested patents—is certainly severe, and is often misleading and deceptive.

The defendant assembles every similar device, description or suggestion in the particular art not only, but also in analogous, and even in remote arts. Everything which has the least bearing upon the subject is brought in and arranged by a skillful expert in an order of evolution which resembles most closely the invention which is the subject of attack. Having thus reached a point where but a single step, perhaps, is necessary to success, and knowing from the inventor exactly what that step is, the expert is asked if the patent discloses invention, and, honestly, no doubt, answers in the negative. There is always the danger, unless care is taken to divest the mind of the idea added to the art by the inventor, that the invention will be viewed and condemned *in the light of ascertained facts.* With his description as a guide, it is an easy task to trace the steps from the aggregation to the invention. When it is remembered that before Sir Humphrey Davy made his safety lamp, wire gauze, and lanterns with perforated tin cylinders were well known, it seems, in the light of the present, as if the idea of substituting the gauze for the perforated tin, being apparently so simple, might have occurred even to a skilled mechanic. So, too, moving the eye from the head to the point of a needle seems, in this age, but a trifling thing, and yet, to the inspiration of genius which suggested these changes, we are indebted for two inventions of inestimable value."

In the case of McGowan vs. New York Packing Co. (October 26th, 1891), Mr. Justice Blatchford, delivering the opinion of the Court, says :

"It is remarked by Judge Nixon, in his opinion, as a fact not to be overlooked, and having much weight, that the Gately packing went at once into such extensive public use as almost to supersede all packings made under

other methods, and that that fact was pregnant evidence of its novelty, value and usefulness. (Smith vs. Goodyear Dental Co., 93 U. S. 495; Loom Co. vs. Higgins, 105 U. S. 591.)"

Mr. Justice Brown, in his opinion, in the case of The Consolidated Brake Shoe Co. against the Detroit Co. (not published), wherein he granted a preliminary injunction, says:

"It is shown, too, that this device (the Ross brake shoe) has gone into general use, and is now employed by a large majority of the railroads throughout the country, which are using brake shoes purchased of Ross or his licensees. Now, while he seems to have made but a trivial departure from the Steel patent—a departure so slight as to raise in my mind a doubt as to its involving an exercise of the inventive faculty, yet I feel that this is a proper case for the application of the rule laid down by the Supreme Court in the case of Smith vs. Dental Co. (93 U. S. 495), that *when the other facts in the case leave the question of invention in doubt, the fact that the device has gone into general use, and has displaced other devices which had previously been employed for analogous uses, is sufficient to turn the scale in favor of the existence of invention.* As Webster says, in his work on patents (page 30):

'The utility of the change, as ascertained by its consequences, is the real practical test of the sufficiency of the invention, and, since the one cannot exist without the other, the existence of the one may be presumed a proof of the existence of the other. Where the utility is proved to exist in any degree, a sufficiency of invention to support the patent must be presumed.'"

See also Yale Lock Co. vs. Sargent, 117 U. S., 537.

Valve Co. vs. Crosby, 113 U. S., 157.

Adams vs. Rathcomb, 26 Fed. Rep., 262.

Piper vs. Shedd, 26 Fed. Rep., 151.

Butler vs. Bainbridge, 29 Fed. Rep., 449.

Celluloid Co. vs. Zylonite Co., 28 Fed. Rep. 248.

There are many other cases of like import, which are applicable to the case now before the Court, but which it is unnecessary to cite.

It sufficiently appears from the evidence in this case, that there was an existing need, at the time of the Augur invention, of some *simple, cheap and practical device for the equalization of springs in a wagon or other vehicle.* It sufficiently appears also, in the evidence, that not one of the defendant's or complainant's witnesess had ever seen the Stowe, Sexton, Stringfellow or other devices named in the defendant's answer, in practical operation anywhere, although some of these witnesses had been practical carriage makers for forty years. It does affirmatively appear in the testimony, that Augur's invention met that need to a limited extent, although it was applicable only to wagons that were specially constructed for the purpose. As soon, however, as the improvement which Topliff & Ely made was disclosed to the trade, it met with universal acceptance, *being applicable to all kinds of side spring vehicles* and was adopted to the exclusion of all other kinds, as the testimony shows, wherever equalizing devices were desired or used on wagons, and *that thou-*

sands of sets were sold by Topliff & Ely, after it had once been introduced to the public.

It further appears in evidence that, in addition to the fact that immense numbers of the device were sold and used, *no other device for that purpose could be found in the market after this device had been introduced.*

However simple the devices of Augur and Topliff may now seem to the Court, the fact that such an equalizer had not been before successfully made or used, is evidence tending to show its novelty, and hence its patentability. *Taking this fact in connection with the other facts above recited, if not absolutely conclusive proof, it is very, very strong proof, and very persuasive proof of the existence of some invention.* The Court will bear in mind the very sensible remarks made by Judge Wallace, to the effect that "such circumstances afford a safer criterion of inventive novelty than any *subsequent opinion of an expert*, or *intuition of a judge*;" and also the remark made by Judge Coxe, that "criticism that an invention is so plain that is must be perceived by all, *comes with poor grace from those who did not themselves perceive it*," and the further remark that, "in judging of the invention, care should be taken not to under estimate its value, because the apparatus, now that we have seen it work, *seems so plain and simple*," and the other remark that the "invention must not be viewed and condemned in the light *of after ascertained facts*."

We contend, finally, that the Augur device shows sufficient invention to entitle the patent to be sustained, on the ground that it was a distinct advance in the art to which it belongs, and was readily recognized, accepted and adopted by the public as a valuable step in advance.

We also contend that the Topliff & Ely patent shows such sufficiency of invention as will entitle it to be sustained on the same grounds as above set forth, and upon the further grounds that it went into general use and displaced every other similar device and that the public, from the time Topliff and Ely introduced it, *acquiesced in the validity of the patent, and therefore, in the sufficiency of invention included in it*, by avoiding all infringements of it. To state the case broadly, if the result of the change made, as in the Topliff & Ely over the Augur device, is *practically, mechanically or commercially great, and if the change made by the patentee be ever so small, so much the more certain we should be that there is present in that device, what we call "invention."*

IX.

REISSUE.

It is contended that the reissued letters patent of Topliff & Ely are void, because they are for a different invention from that covered by the original patent, and therefore are null and void.

The original patent was granted and dated December

19, 1871, the first reissue was granted April 9, 1872—a little more than three months after the original patent was granted. This first reissue was surrendered, and a new reissue applied for May 16, 1872—within a period of about five weeks.

The invention described and claimed in the original patent consisted of "the arms arranged upon the separate rock rods, secured directly to the front and rear axles, to cause both ends of each spring to yield simultaneously and in unison with each other." The device itself consisted of two separate rock rods, having arms formed upon each end thereof, and hinged to the *front bolster* and the *rear axle* of a wagon, each end of the side springs being hinged to the outer ends of these rock rods.

This device, which constituted the subject matter of the original patent, constitutes the entire subject matter of the first and second reissued patents. The reissued patents suggest no change in its construction, and add nothing to the device, and take nothing from it. The subject matter of the original and reissues is therefore the same identical structure.

There was but one claim in the original patent and this was repeated in the first reissue. The two claims of the last reissue were based upon the same device as the claim of the original patent, to-wit: the combination of the rock rods with their arms and the side springs.

It is apparent on the face of the original patent, that

the claim did not describe an operative device. The rod, if "secured directly," as stated in the claim, "*to the front and rear axles*," could not possibly operate. The rods must be secured to the "*front bolster and rear axle*" to make the device at all operative. Here was such a *mistake* in the wording of the claim, as to bring it directly under the statute providing for a reissue to correct such a mistake, and almost immediately upon the issue of the original patent, the mistake was seen, the original was surrendered and a reissue granted, which corrected the mistake in the original claim, and made the device, as thus claimed, an operative one. As soon as this first reissue was granted, it was at once seen that another mistake had been committed, in not claiming clearly all that the inventor was entitled to claim in his original drawings and specifications, and this first reissue was thereupon surrendered, and, upon the same specifications, a new reissue was granted, giving to the patentee all that his first specifications warranted him in claiming, and nothing more.

These are the facts, and the legal question is, was the second reissue, so taken out, a lawful reissue under the terms and meaning of our patent statutes?

X.

LAW OF REISSUES.

It has invariably been held by the Courts, that a

reissue was "for the same invention" as the original patent, within the meaning of the statute, if the reissue claimed the invention or inventions that were "*shown, described or substantially indicated in the description, drawings or model of the original patent*," whether there had been any apparent attempt to claim all of them in the original patent, or not, and whether the reissue claims were broader than the original claims, or not. If it was merely "found in the original description, drawings or model," and described and claimed in the reissue, that was sufficient. It was not denied that the Courts could inquire into the identity of the *subject matter*, but their inquiry was concluded, if they found, anywhere in the description, drawings or model, *the same subject matter;* and on the question of identity of invention, it was presumed that the inventions were identical, until the contrary was made to appear.

Klein vs. Russell, 19 Wall., 433-463.

Marsh vs. Seymour, 97 U. S., 348-356.

Morey vs. Lockwood, 8 Wall., 230-241.

Seymour vs. Osborne, 11 Wall., 516-544.

The Cornplanter Patents, 23 Wall., 181.

It has been repeatedly announced by this Court that, in the absence of an *estoppel of record* (as in the patent office proceedings), and of any change in the *structure of the machine*, the decision of the Commissioner of Patents,

in granting the reissue, was conclusive and final on the question of inadvertence, accident or mistake.

Rubber Co. vs. Goodyear, 9 Wall., 788-796.

Seymour vs. Osborne, 11 Wall., 516-543.

The Cornplanter Patents, 23 Wall., 181-217.

Russell vs. Dodge, 93 U. S., 460 464.

It has always been held by this Court that a reissue was not permitted for the purpose of dissecting the original machine, and reconstructing *another and a different machine out of its parts.* The invention, that is to say, the particular thing invented, must be identically the same thing in the reissue, as was found, shown or indicated in the original; and so every reissue which sought *to change the structure of the thing itself*, and then to base claims in whole or in part upon the structure as thus changed, has always been held invalid and void.

Manufacturing Co. vs. Ladd, 102 U. S., 408.

Ball vs. Langlas, 102 U. S. 128.

But in these, and other cases which might be cited, this Court has held that it was competent for a patentee, at any time during the term of the patent, to reissue the patent to cover anything of novelty described, shown or substantially indicated in the description, drawings or model of the original patent, and not before that time disclaimed by him, whether such things were claimed in the original patent, or not, and whether the claims of the original were or were not thus broadened by the reissue.

The only limitations were that, if the invention related to a machine, the machine could not be changed in its construction, and that the rights of other parties had not intervened in the meantime. The question of inadvertence, accident or mistake was not open, after the reissue was granted, except in cases where the subject matter of the reissue claims could not be found in the original description, drawings or model, or where the patented structure had been altered in its mechanical elements, or where the patentee had estopped himself by acts appearing of record in the Patent Office proceedings, and amounting to an abandonment of the subject matter.

We believe the above fairly states the law as it existed and was enforced by this Court down to the time when the case of Miller vs. Bridgeport Brass Co., 104 U. S., 350, was decided.

While it cannot be fairly said that the decision of this Court in that case changed the law, as it previously existed, in any respect, it did certainly announce definitely, certain rules by which courts should be guided in the construction of reissued patents, and in enforcing rights under them.

As to reissues for enlarging the claim or claims, what this Court did in that case, as explained by the subsequent case of Mahn vs. Harwood, 112 U. S. 354, was this:

First. It held that such a reissue was allowable in proper cases.

In the next place, it held that the right to take out such a reissue should henceforth be "regarded as having been abandoned and lost, and the Commissioner will be held to have exceeded his authority in granting it," *unless* the application for a reissue be made "*within a reasonable time*" after the granting of the original patent.

In the next place, it held that it was a question for the Court to determine, as a question of law, from a comparison of the reissued patent with the original patent and the Patent Office records, whether the reissue was or was not applied for within a reasonable time.

In the next place, it held that two years from and after the date of the original patent is a *reasonable limit within which such a reissue could be applied for*, and that "excuse for any longer delay than that should be made manifest by the special circumstances of the case."

Mahn vs. Harwood, 363.

In other words, if applied for within two years, there would be no *presumption of abandonment*, and therefore, no necessity for any testimony to excuse or apologize for the delay, but if the delay in making such application for a reissue was more than two years, there would be a presumption of abandonment, which could only be rebutted by evidence.

In the next place, this Court held (Mahn vs. Harwood, 360) that the decision of the Commissioner of Patents, in granting the reissue, should still be, as it always

had been, conclusive and final, as to the actual existence of inadvertence, accident or mistake in the granting of the original patent, "unless where the matter is manifest from the record."

And, finally, this Court left the actual identity of the *subject matter* of the original and reissue to be determined by inspection of the *face of the patents*, and in this respect followed the law as it already existed.

From this review of what was decided by this Court in the two cases referred to, it clearly appears that, while the Court was thus laying down definitely, general rules by which reissues were to be governed, the only substantial change in the law, as it had been theretofore repeatedly held by this Court, consisted in establishing the rule that the right to enlarge the claim by reissue becomes presumptively abandoned at the end of two years from the date of the original patent, but that such presumption of abandonment may be rebutted by satisfactory evidence.

The matter of reissues has repeatedly come before the Courts since the decision of the two cases above referred to, and the only additional limitations over and above those above cited, upon the right to reissue a patent and obtain an enlargement of the same, consist in this: *that where the rights of third parties have intervened since the granting of the original patent, such reissue would not be allowed, if it affected those rights.* In not a single one of the cases subsequently decided, has this Court required

the production of evidence to explain and justify a delay of less than two years, except where the rights of third parties are affected.

It is true that this Court, in several cases where reissues have been applied for within the two years, for the purpose of broadening the claim, has held the reissue invalid—not by reason of the *delay in making application for the reissue, nor by reason of the mere broadening of the claim*, but for other reasons, that, under the former decisions, would have been equally fatal, that is to say,—because the reissue sought to change the mechanical construction of the patented article, and make a substantially different article out of it, and, in other cases, because it conclusively appeared from the Patent Office records, that the patentee had abandoned the controverted claims, prior to the grant of his original patent, and was therefore estopped to set them up again in his reissued patent.

It is clear, therefore, that the Topliff & Ely reissue does not fall within any of the rules of this Court, which would make it invalid and void, assuming that what is claimed for it by the defendant's counsel is true, to wit: that the claims of the reissue are broader than the claim of the original.

In the first place, the first reissue was applied for within four months after the original was granted, and was granted in order to cure a plain mistake in the original. The second reissue was applied for thirty-six days

after the date of the first reissue, and the two claims in it were allowed, and the reissue granted, in order to cover what *was plainly shown and indicated in the original.*

In the next place, no rights of third parties intervened between the grant of the original and the application for the second reissue.

In the next place, there is no estoppel of record.

In the next place, this reissue does not seek to change in any respect whatever, *the mechanical construction shown and described in the original patent.*

In the next place, this reissue is for the same mechanical subject matter as the original, that is to say, the combination of two rock rods at the front and rear ends of a wagon, with a pair of half-elliptic springs, which combination, in the original and in the reissue, is composed of the same elements, arranged in the same manner, and produces the same result. The insertion of two claims in the reissue for the one in the original does nothing more than enlarge the claims of the patent, if it does that. *The device itself remains precisely the same.*

In the next place, the decision of the Commissioner of Patents, in granting this second reissue, is a final and conclusive judgment that the claims now made, if they are enlarged by the reissue, were omitted from the original patent through inadvertence, accident or mistake, and without any fraudulent or deceptive intention.

These things being true, the law as laid down by this

Court, says that the patentees ought not to be deprived of the benefit of so valuable improvement (and we shall discuss later, the immense value of this improvement) through mere inadvertence, accident or mistake in drawing the application for the original patent, which was intended to protect the full rights of these patentees to their inventions.

The field of the invention referred to in the claim of the original is exactly coterminous with the field of the invention referred to in the two claims of the reissue. The mistake of the patentees was that, in drawing their original claim, they did not properly cover the whole field. This was the error which needed correction, and that a reissue, if applied for within two years, is the proper way to correct it, is expressly held in Miller vs. Bridgeport Brass Co., 353, where the Court says: "that an omission to claim other devices or combinations apparent on the face of the patent" *may be corrected by reissue, if applied for within reasonable time*, and that, by analogy to the law of public use, two years is a reasonable time for so correcting the error.

The language of this Court on this point is broader than is necessary, to validate this reissue. It does not in any way limit a reissue to the thing claimed in the original, but expressly extends its scope to "*other devices or combinations apparent on the face of the patent.*" Such other devices or combinations may be covered, if the

reissue be applied for within two years, it being intended to make the law protect the real advance made by the inventor in the art, unless he shall have lost the right by abandonment.

In our case it is not necessary to appeal to this declaration of the Supreme Court, because the reissue in controversy claims precisely the same thing as the original attempted to claim, only in broader language, so as to more fully and clearly cover the whole invention.

The additional matter contained in the specifications of the reissue are simply by way of explaining the defects of the prior inventions of the same character.

Mr. Justice Bradley, in Kearney vs. Lehigh Valley R. R. Co., 32 Fed. Rep., 320, says, on this point:

"The paragraphs which explain the difficulties and defects of prior spark arresters, and how the patentees have avoided them by their invention, *cannot be regarded that sort of new matter which renders a reissue void.*"

XI.

TITLE OF AUGUR PATENT.

It is contended by the defendant's counsel, that the complainants cannot maintain their bill on the Augur patent, and recover more than the amount for which that patent was assigned as security, to-wit: $2,000.00 with interest at 12 per cent. from the date of the note, February 4th, 1873, and that, in order to entitle the

complainants to recover more than this sum, it would be necessary to join Augur as a party complainant.

In the first place, we say that the objection of want of proper parties to the bill should have been taken, if at all, in the Court below, by demurrer or motion, and that it is too late, on an appeal to this Court, to make this objection.

In the next place, whether Augur was a proper or necessary party complainant depends upon the construction to be given the various assignments through which title to the patent was conveyed to these complainants. The record shows that the patent to Augur was granted October 11, 1870.

Augur assigned this patent, and his whole right, title and interest in and to the inventions secured thereby, to one Charles Atwater, on February 4th, 1873. This instrument was made upon the condition that if Augur should pay a note of $2,000, made by him to Atwater (which note was dated February 4th, 1873, and made payable one year after date, with interest at the rate of 12 per cent. per annum), the assignment should be void; otherwise, in full force and effect in law.

Subsequently, on the 9th of April, 1883, Atwater assigned all the right, title and interest that he thus acquired in this patent and note to Cyrus W. Saladee and, in the same instrument, assigned to Saladee "*all claims and demands that I have or may have, for damages and*

profits accrued or to accrue for the past use of said improvements and letters patent therefor, without license." Atwater also covenanted that Augur's note, both principal and interest, remained unpaid.

Subsequently, Saladee assigned to these complainants, all his right, title and interest thus acquired in the Augur patent and note, "*together with all claims or demands for the past use of said improvements, patented as aforesaid, without license.*" Saladee also, in the same instrument, warranted his title to the patent, against the claims of all persons whatsoever.

As a matter of law, the assignment from Augur to Atwater vested in Atwater the whole legal title to this patent, and Atwater thereupon became the general owner of it, and entitled to the possession and use of it. His title was liable to be divested, on the performance of the condition by Augur, but, until that condition was performed, Atwater was the legal owner of the patent and all rights secured by it. When the note became due and was not paid, there was a breach of the condition, and the title of Atwater thereby *became absolute in law.*

The effect of assigning the note and the instrument securing it, by Atwater to Saladee, and by Saladee to the complainants, was a transfer by each of the assignors, of his entire interest in the patent and the rights secured by the patent, to the complainants, who thereby became entitled to all the rights of the mortgagee, Atwater, under

the mortgage, which entire interest, as above stated, was that of a general owner, holding the entire legal title, and entitled to the full possession of the patent, and the use of it. In other words, the legal effect of these assignments was the same as if Atwater, the mortgagee, had been in possession of the patent as patentee, or legal owner, and had sold it and delivered it to the complainants.

In support of this position, we refer to the case of Waterman vs. McKenzie, decided by this Court in 1891, and reported in 138 U. S., 252. Mr. Justice Gray, who delivered the opinion of the Court, said :

"The remaining question in the case, distinctly presented by the plea, and adjudged by the Circuit Court, is of the effect of the deed of November 25th, 1884, by which Mrs. Waterman assigned to the firm of Asa L. Shipman's Sons, all her right, title and interest in the invention and the patent, with an express provision that the assignment should be null and void, if she and her husband, or either of them, should pay at maturity a certain promissory note of the same date, made by them, and payable to the grantees. This instrument, being a conveyance made to secure the payment of a debt, upon condition that it should be avoided by the subsequent payment of that debt at a time fixed, was a mortgage, in apt terms and in legal effect. (Conard vs Atlantic Ins. Co., 1 Peters, 386, 446, 447.) On the same day, the mortgagees assigned by deed to Asa L. Shipman, all their title under the mortgage and the promissory note thereby secured. Both assignments were recorded in the Patent Office within three months after their date, and the title thereby acquired by Shipman, was outstanding in him at the

times of the subsequent assignment of the patent right by Mrs. Waterman to the plaintiff, and of the filing of this bill. This last assignment was, therefore, subject to the mortgage, though not in terms so expressed.

"By a mortgage of personal property, differing in this respect from a pledge, it is not merely the possession or a special property that passes, but both in law and in equity, the whole title is transferred to the mortgagee, as security for the debt, subject only to be defeated by performance of the condition, or by redemption on bill in equity, within a reasonable time, and the right of possession, when there is no express stipulation to the contrary, goes with the right of property. Story on Bailments, sec. 287; Story Eq. Jur., secs. 1030, 1031; Conrad vs. Atlantic Ins. Co., 1 Peters, 386, 441; Casey vs. Cavarock, 96 U. S., 467, 477; Boise vs. Knox, 10 Met. 40, 43; Brackett vs. Bullard, 12 Met. 308, 310. * * *

"When the right of possession, as well as the general right of property is in the mortgagee, the suit must be brought by the mortgagee, and not by the mortgagor, or any one claiming under a subsequent conveyence from him. (Authorities cited.) When it is provided by statute, that a mortgage of personal property shall not be valid against third persons, unless the mortgage is recorded, a recording of the mortgage is a substitute for, and (unless in case of actual fraud) equivalent to a delivery of possession, and makes the title and the possession of the mortgagee good against all the world. (Authorities cited.)

"A patent right is incorporeal property, not susceptible of actual delivery or possession, and the recording of a mortgage thereof, in the Patent Office, in accordance with the act of congress, is equivalent to a delivery of possession, and makes the title of the morgagee complete, towards all other persons, as well as against the mortgagor.

The right conferred by letters patent for an invention is limited to a term of years, and a large part of its value consists in the profits derived from royalties and license fees. In analogy to the rules governing mortgages of lands and of chattels, and with even stronger reason, the assignee of a patent, by a mortgage duly recorded, whose security is constantly wasting by the lapse of time, must be held (unless otherwise provided in the mortgage) entitled to grant licenses, to receive license fees and royalties, and to have an account of profits or an award of damages against infringers. There can be no doubt that he is 'the party interested, as patentee, assignee, or grantee,' and, as such, entitled to maintain an action at law to recover damages for any infringement; and it cannot have been the intention of congress that a suit in equity against an infringer, to obtain an injunction and an account of profits, in which the Court is authorized to award damages, when necessary to fully compensate the plaintiff, and has the same power to treble the damages as in an action at law, should not be brought by the same person. (Rev. Stat., secs. 4919, 4921. Root vs. R. R. Co., 105 U. S., 189, 212.) The necessary conclusion appears to us to be that Shipman, being the present owner of the whole title in the patent, under a mortgage duly executed and recorded, was the person, and the only person entitled to maintain such a bill as this, and that the plea therefore, was rightly adjudged good."

On this express authority, then, which is a case on all fours with the case at bar, we insist that, by virtue of these assignments, the complainants are the only persons who could have brought an action for infringement on the Augur patent and that Augur was not only *not a necessary party, but would be an improper party to join in such a suit.*

But it is also contended that the complainants are entitled to recover damages and profits only from the date of the assignment by Saladee to them, which date was April 9th, 1884.

The Court will, however, notice that Atwater acquired the whole legal title to this patent in 1873, and, by virtue of that title, thus acquired, he was the legal owner of all claims for damages and profits that might arise as against an infringer, from the unlawful use and practice of the invention covered by this patent. Such claims for damages as had or might accrue to Atwater during the time he thus owned this patent, he conveyed to Saladee on April 9th, 1883, and all these claims, and all like claims which arose after Saladee acquired the ownership of this patent, Saladee assigned to the complainants, and the complainants thereby became the owners of all such claims for damages, which had or might have accrued from 1873 down to the date when the complainants acquired the patent, that is to say, April 9th, 1884. Of course, all claims for such damages as accrued after the assignment by Saladee to the complainants, belonged to the complainants by virtue of their ownership of the patents, and the rights thereby secured, so that, in law, the complainants acquired title to all claims for damages arising out of any infringement of this patent, from 1873 down to the present date. The complainants' bill alleges that the defendant, "without the license of the complain-

ants, and in violation of their rights, since the granting of their own patent, and *since the granting of the Augur patent, and since and before the making of said assignments*, made, used and offered for sale, and sold to others, to be used, said inventions and improvements," and, in their prayer, prayed an accounting for all the damages which had accrued or shall accrue to them on account of the defendant's infringements of their own and the Augur patent, "*both before and since the assignment*," so that the complainants, in their bill of complaint, and in the proceedings subsequent to the filing of the bill, down to the time the decree was entered, were seeking to enforce their rights, not only under their own patent, but also under the Augur patent, *and under the assignments above referred to*.

Should the Court come to the conclusion that the Topliff reissue is void, either because the original patent was anticipated by the Augur patent, or because the reissue is not for the same invention as the original, and the complainants are obliged to rely on the Augur patent to sustain the Master's report and the decree as to the amount of damages, we apprehend that the Court will find no difficulty in sustaining the Master's report and the decree as to the amount of damages, on the ground that they are covered by the Augur patent.

If we are right in our contention that the Augur patent, in view of the state of the art as it existed at the

time of that invention, is entitled to a somewhat broad construction, and that the Topliff patent, in view of the Augur patent, must be held to be only subsidiary to the Augur patent, and, with that construction upon it, the Court should then hold that the reissue was void, simply and only because it was not for the same invention as the original, the Court would have no difficulty in finding, from the testimony in this case, that all the connecting rods made by the defendant are properly and legally infringements of the Augur patents, and that the defendant must account to the complainants for such unlawful manufacture and sale.

This brings us to a discussion of the Master's report, and the decree affirming it.

XII.

DAMAGES.

The record shows that, prior to 1882, the complainants, Topliff & Ely, were largely engaged in the manufacture of carriage bows and the equalizers which are covered by the patents in suit; that during this time, Isaac Topliff, the defendant, was in the employ of the complainants, and travelling for them as their sales agent, and was fully acquainted with all the customers of the complainants, and, as such sales agent, was personally dealing with them; that in 1881 or early in 1882, the defendant, with full knowledge that the complainants

were the owners of the patents in suit, and were engaged in the manufacture and sale of these patented equalizers, deliberately and willfully entered upon the manufacture and sale of the same, and continued said manufacture and sale of these equalizers down to the date of the entry of the decree in this case, with full knowledge of the complainants' exclusive rights under the patents; and the only excuse the defendant could make or has ever made for such willful piracy, was that he could sell certain other of the articles of his manufacture, to wit: carriage bows, to better advantage in connection with these equalizers of the complainants, than he could without it.

It is further shown in the testimony that, taking advantage of his former connection with the complainants as their sales agent, and his acquaintance with their customers, he pushed his sales of his infringing equalizers among those customers, and in this way, drew off from Topliff & Ely, the complainants, an immense amount of trade among their customers, which, had it not been for the defendant's infringement, would have gone to the complainants. The evidence amply shows that it was not in ignorance of the rights of the complainants on the part of the defendant, which led him into the commission of these acts of infringement, and that there are no circumstances to palliate his conduct, or mitigate the damages that have been assessed against him, for his willful violation of the rights of the complainants.

The evidence further shows that, from the time the defendant began to manufacture the complainants' device, to-wit: April 8th, 1882, he made and sold over sixteen thousand sets of this device. His contention is that, on this manufacture and sale, he made no profit; that, on the contrary, his manufacture and sale was at an actual loss to himself. We think that his own testimony, and the statements submitted by him, if carefully analyzed, would show that some actual profits on his manufacture and sale of these articles were realized by him, but we do not regard this as important, for the complainants are not in law confined to an accounting for the mere gains and profits of the defendant, in his manufacture and sale, but are entitled to recover from him the actual damages suffered by them from his infringement, no matter whether his wrongful use of their invention brought him actual profit or actual loss. This is the view taken by the Master and by the Court in its decree.

1. The Master's finding, and the decree of the Court confirming it are correct as far as they go. The complainants in their cross-appeal, insist that the Master in his report, and the Court in its decree did not find and decree all the damages to which the complainants are entitled. This is assigned as error by the complainants, in their appeal, and is discussed later on in the brief.

The rule determining the measure of damages in cases like this, is so plain and clear, and the extent and limitations of the rule have been discussed and laid down in so

many cases, that there can be very little difficulty in applying it to the facts in this case. Sections 4919 and 4921, U. S. Rev. Statutes limit the amount to be recovered as damages, to "the actual damages sustained" by the patentee or owner of the patent, which phraseology has been construed by this Court to mean compensation for the pecuniary injury actually sustained by the patentee or owner, by reason of the defendant's infringement, without regard to the question whether the defendant has gained or lost by his unlawful use of the particular invention.

Birdsall vs. Coolidge, 93 U. S., 64.

Seymour vs. McCormick, 16 How., 480.

Suffolk Co. vs. Hayden, 3 Wall., 315.

Phelp vs. Nock, 17 Wall, 460.

Where a royalty has been charged, or a license fee established, that royalty or license fee ordinarily becomes the measure of damages. Where, however, the patentee has kept his rights under his patent a close monoply, and has granted no licenses, his damages, in case of infringement, are measured by the amount he would have realized from such monoply, if there had been no infringement, but which that infringement has prevented him from realizing. In other words, he is entitled to recover compensation for the pecuniary injury actually sustained by him, from the infringing acts of the defendant.

Mr. Walker, in his valuable work on patents, section 563, sums up the whole doctrine as follows:

"Where the owner of a patent is able to supply the whole demand for the thing it covers, and where the whole demand would go to him, if not diverted by some infringer, it is clear that the injury caused by a particular infringer can be ascertained by finding what pecuniary advantage the owner of the patent would have derived, if he had supplied that portion of the demand which was supplied by that infringer. The two conditions of this rule are pre requisites of its applicability. The highest authority has announced, 'what a patentee would have made, if the infringer had not interfered with his rights, is a question of fact, and not a judgment of law.' In order to show that a patentee would, in fact, have made a particular profit, if an infringer had not forestalled his sales, it is necessary to show that he would, but for that infringer, have made those sales, and to that end, it is necessary to show that he could have supplied the articles wanted, and that the persons wanting those articles would have bought them of him, had not the infringer interfered. Where those facts are proven, the damages of the patentee will consist of the profit which he would have derived from the sales made by the infringer, if the patentee had made those sales, supplemented by the amount of whatever reduction of price the patentee was compelled, by the defendant's competing infringement, to make, even upon the goods he sold. Where it does not appear that the owner of a patent could and would have supplied the demand which was supplied by the infringer, even if no infringer had interfered, this last mentioned element of damages may still be proven, and a verdict found upon it alone."

In Birdsall vs. Coolidge, 93 U. S. 64, this Court says:

"Damages of a compensatory character may also be allowed to the complainant suing in equity, in certain cases

where the gains and profits made by the respondent are clearly insufficient to compensate the complainant for the injury sustained by the unlawful violation of the exclusive right secured to him by the patent. Gains and profits are still the proper measure of damages in equity suits, except in cases where the injury sustained by the infringement is plainly greater than the aggregate of what was made by the respondent, in which event the provision is that 'the complainant shall be entitled to recover, in addition to the profits to be accounted for by the respondent, the damages he has sustained thereby.'"

In Marsh vs. Seymour, 97 U. S. 348, this Court says:

"Damages of a compensatory character may be allowed to a complainant in an equity suit, where it appears that the business of the infringer was so conducted that it did not yield any substantial profits."

In Yale Lock Co. vs. Sargent, 117 U. S. 536, the Master was unable to determine whether the defendant had made any profits, but reported a certain sum as damages, by reason of the enforced reduction of prices on the locks which the plaintiff sold, caused by the defendant's infringement. In this case, the Court says:

"That this is a proper item of damages, if proved, is clear. It is a pecuniary injury, caused by the infringement, and is the subject of the award of damages, although the defendant may have made no profits, and the plaintiff may have had no established license fee. As the plaintiff, at the time of the infringement, availed himself of his exclusive right, by keeping his patent a monopoly and granting no licenses, the difference between his pecuniary condition after the infringement, and what his condition would have been, if the infringement had not occurred, is

to be measured by the difference between the money he would have realized from such sales, if the infringement had not interfered with such monopoly, and the money he did realize from such sales."

And the Court further says:

"The damages to be recovered under the statute are 'actual damages,' and they properly include such loss to the plaintiff as was allowed in this case. (1 Woods, 153, 161; 17 Wall., 460.)"

By way of explaining the fact that two reports of the Master appear in the record, we would say that this case was referred to a Master, to take an account and report his findings, and, on that order, the Master, on October 11th, 1886, filed a report, which is found on page 151 of the printed record. This report, on exceptions filed, both by the complainants and by the defendant (see pages 198, 199, Printed Record) was set aside by the Court for error, in said findings, and the cause was again referred to the Master, additional proofs were taken before him, and on March 30th, 1888, the Master filed his second report (Printed Record, pages 205, 210) which was, on May 17th, 1888, confirmed by the Court, and a final decree entered thereon. It is to this report of damages, and the decree founded thereon, that error was assigned.

The error assigned by the defendant as to the Master's report and the decree of the Court confirming it, resolves itself into two propositions:

1st. That the basis on which the Master computed the damages was not the correct basis, for the reason that

he computed damages for the infringement of the Topliff patent and the Augur patent, instead of computing the damages on the basis of the Augur patent alone.

2nd. That the result of the Master's computation, to-wit, the amount which he found and which the Court decreed against the defendant was erroneous for the same reason.

The record shows that the only exception which the defendant took to the Master's report was as to the amount found by the Master, in view of the "Stringfellow" patent, and that, in view of that patent, the Master should have reported only nominal damages. (Record, pp. 238 9.) This is the exception which was overruled by the Court, and it is the only exception which the defendant took to the Master's finding, thus admitting as we claim, that in all other respects the Master's finding was correct; and it is from this ruling of the Court, alone, so far as the Master's report is concerned, that any appeal has been taken.

The defendant having taken no appeal from the ruling of the Court upon the Master's report, except on this point, he certainly cannot assign anything else for error in the Master's report, unless such error plainly appears on the face of the report.

See Rule 10, Supreme Court Rules.

1. The record clearly shows that, during the whole time the defendant was infringing, the complainants were the owners of the Topliff patent, and were the owners of

the Augur patent during a greater part of that time; that, during the whole period, the complainants were keeping the rights secured to them by these patents, as a close monopoly, and were not granting licenses. Under the law, therefore, they were entitled to recover from the defendant, as one element of damages, the profits they would have realized from the sales made by the defendant, if they, the complainants, had made those sales.

This involves several questions of fact.

First: Were the complainants' facilities such that they could have supplied the public demand for the article?

The testimony of G. H. Ely, one of the complainants on this point, is clear and positive, and there is no contradictory proof that the complainants' ability to supply all the demands during the whole period of the infringement, was ample, without any addition to their machinery and appliances. Ely, in answer to the question: "What facilities did you have for manufacturing these articles in large quantities?" said (pages 174-5 Printed Record):

A. "We never have made over ten or twelve thousand sets a year, but we could have made fifty thousand sets, if it had been required, without any addition to our machinery."

Q. "Without increasing your machinery or other appliances, save labor, what would be and has been your capacity for making equalizers, during the last five years, say since 1881?"

A. "We have made all that the trade called for, and could have made several times that."

The Master, in his report, discusses this question, and finds as follows (Record p. 206):

"They owned the patents covering the product, and equipped their establishment with sufficient machinery to enable them to supply the market with their invention, and they neither issued licenses, nor established royalties for the manufacture or use of their improvement."

Second: Could the complainants have made those sales, if the defendant had not infringed?

It is not necessary for us to call particular attention to the testimony on this point, as the Master's finding from that testimony is full and conclusive. He says (Record p. 207):

"The demand for the equalizing device was limited. The complainants had the facilities to fully and promptly supply all the demands of purchasers. They refused to grant licenses. There were but two establishments producing and selling the invention, viz: the complainants' and the defendant's. There is some testimony tending to show that some other similar device was in use, but no other producers had been pressing the sales of such articles for some years. There was a demand for this equalizer, in certain parts of the country, where it was deemed a very necessary and desirable article. The purchasers were therefore seeking it, and so long as the trade offered it, they would have purchased it from the one or the other of these establishments.

"Since my former report, the defendant has produced, upon the demand of the complainants, a list of his customers to whom this article was sold. This list has been compared

with complainants' books, and one of them testifies that, with the exception of twelve firms, every one of the defendant's customers had been customers of the complainants previous to defendant's infringement. The testimony also shows that, with one exception, at or near each of the places where these twelve new dealers were located complainants had agents or customers who could have supplied the public at those places with rods. The defendant, as a witness, himself concedes that if his product had been out of the market, his customers could not well have obtained these rods from any one else but from the complainants, and says he does not know of any good reason why they would have continued to buy their equalizers of complainants, if he had not been manufacturing."

This point is further illustrated by a reference to the complainants' sales during the years previous to, and covered by the defendant's infringement. See complainants' Exhibit No 1 (page 154 Printed Record), where it is shown that complainants' sales in 1880 were about 8500 sets; in 1881 they were over 9900 sets; in 1882—being the first year of defendant's infringement—they were 9881; in 1883, the second year of defendant's infringement, when the effect of it became more visible, the complainants' sales were reduced to 7,436; and in 1884, were 5,343. It will be seen here that the sales of the complainants show a gradual increase up to the first year of the infringement, when the effect of the competition begins to be visible. Adding the sales of the defendant to those of the complainants for this year, the total is only the natural increase which might be expected to be shown in such sales, if the defendant had not infringed.

This point is further illustrated by the uncontradicted fact that, in the first quarter of the year after the defendant was enjoined from further manufacturing and selling, the complainants' sales were doubled. This proves with more force than any other single fact in the testimony, that every sale made by the defendant was a theft from the complainants. And the Master, in reporting on this point, says (Record p. 208):

"That complainants' sales were well maintained until defendant's infringement began, when they fell off very nearly in the proportion that defendant's increased; and that very promptly after defendant was enjoined, complainants' sales rapidly returned *and doubled in the first three months*; that defendant himself concedes that he does not know of any good reason why complainants' customers would not have continued to purchase from them, if he had not been manufacturing."

If the Court will look at the testimony of George H. Ely, one of the complainants, and of Isaac Topliff, the defendant, which was produced before the Master, the Court will become satisfied that the fact that the customers of Isaac would have purchased the rods from Topliff & Ely, if Isaac had not been an infringer on the market, is proven beyond a question, by the only kind of proof that, in such a case, can be made, to wit: circumstantial evidence. It is strengthened also by the fact that, for some years, Isaac was the sales agent of the complainants, was familiar with their customers, and that the most natural thing, under the circumstances, for him to do when he began

manufacturing, was to introduce his manufacture to the old customers of the complainants, with whom he was familiar.

Third: It will be seen from the Master's report, that he made a very careful and exhaustive analysis of all the testimony in the case bearing on the question of damages, and that the results he arrived at are fairly deducible from that testimony. We will not unduly lengthen this brief by following the Master in his computation. It is sufficient to say that, as far as he has gone, his findings are correct upon the testimony. We think he did not go far enough, and have assigned, as error, his refusal to make further findings on one or two other points.

Fourth: The defendant, Isaac, and George H. Ely, one of the complainants, both testify that no other equalizing device was on the market during the period of the defendant's infringement. The so-called "Stringfellow" device was not intended to equalize, and if in any measure it did equalize the action of the springs, all the witnesses in the original hearing testified that the device itself was unmarketable for any purpose, and that not a single one, if offered for sale, could be sold to-day, to be used on a buggy or carriage.

It cannot, therefore, be said that, in this case, there was any standard of comparison by which the value of the complainants' device over any other then existing device was to be measured. If there were any other useful features in the infringing device of the defendant, which

are not included in the complainants' device, the burden of proof is upon the defendant to show to what extent the value of such additions should be deducted from the damages found by the Master. In Rubber Co. vs. Goodyear, 9 Wall., the Supreme Court, speaking of the Master's report, says:

"He refused to allow the profits due to the elements not patented, which entered into the composition of the patented articles. There may be cases in which such allowance would be proper. * * * The conduct of the defendants in this respect has not been such as to commend them to the favor of a court of equity. Under the circumstances, every doubt should be resolved against them. A more favorable rule would offer a premium to dishonesty, and invite aggression."

Considering the fact as shown in the testimony, that the infringement of the defendant in this case was a wilful one, and was made with full knowledge of the complainants' rights, and considering further, that he offered no proof at all, to show any other useful feature in his infringing device, which was not included in the complainants' device, the Master's failure to allow anything for such features is not to be imputed as error.

2. But, assuming that the point made by the defendant's counsel, to-wit: that the complainants are entitled only to those damages which the proof shows they have suffered by reason of the defendant's infringement of the Augur patent, since the date of their purchase of that patent to wit: April 9th, 1884, is well taken, then, we say,

that the testimony in the printed record affords the necessary information to enable this Court to make and state a proper account and to decree the amount of such damage.

The statements of the complainants and the defendant, together with the testimony taken before the Master shows the number of infringing devices made and sold by the defendant between the above mentioned dates, to-wit: April 9th, 1884, and the filing of the Master's report. This would require a simple computation upon ascertained facts and figures, and it will not be necessary for us to enter upon that computation in this brief. We do not apprehend that this Court will feel itself forced to any such conclusion as the defendant's counsel contends for, but, if we are mistaken in this, we repeat that ample materials exist in the record to enable the Court to compute the actual damages suffered by the complainants by reason of the defendant's infringing the complainants' rights under the Augur patent, since April 9th, 1884.

COMPLAINANTS' APPEAL.

Assignment of Error.

1. That the Court erred in rendering a decree against the defendant for the sum of $8,480.51, when said decree should have been for a much larger amount.

2. That there was error in the Master's finding, as to the amount of damages, and as to the basis on which his computation of damages rested.

3. That the Court erred in over-ruling the complainants' motion to increase the damages, and in refusing to give a decree for such increase of damages.

First. The complainants claim that the decree of the Court below was for an amount much less than they were entitled to on the testimony, and that there was error in the Court's refusal to give a decree for the amount claimed by the complainants, as shown on the face of the record. We have already discussed, in our brief on the defendant's appeal, the question as to whether the complainants would have made the sales which the defendant made, if the defendant had not infringed, and it is not necessary to repeat, except perhaps briefly, what we claim on that point. The testimony is clear, and the Master so finds, that for some years before the defendant began manufacturing, he was the sales agent of the complainants, and was familiar with their customers, and that the great body of the cus-

tomers to whom he sold these infringing devices, had been the customers of the complainants, while he, the defendant, was acting as their sales agent.

The defendant was required to produce, and did produce before the Master, a list of all parties and firms to whom he sold equalizers from the time he began to manufacture and sell them. (Record pp. 223 6.) This list was submitted to Ely, the business manager of the complainants, who testified that *all the persons and firms named in the list thus produced by the defendant, had been and were, up to the time the defendant began to manufacture, regular customers of the complainants, except the twelve individuals and firms named in the second list that the defendant produced.* (Record, pp. 214 215.) This second list of the defendant contains the names of those twelve of his customers who were not customers of the complainants prior to the commencement of defendant's infringement, and also contains the number of equalizers sold by the defendant to them, down to the time the account was closed. The whole number of equalizers sold to these twelve parties amounts to 1307 sets. (Record pp. 225 6.)

The defendant further testifies that he knows of no reason why these customers (excepting the twelve named) would not have continued to buy from the complainants, if he, the defendant, had not been manufacturing, and able to supply them. (Record, p. 214.)

The defendant further testifies that he knew of no one

else, except the complainants who were in the business of manufacturing these rods, or from whom these customers could have bought rods if he, the defendant, had not been making and selling them. (Record p. 214.)

Mr. Ely, one of the complainants, testifies that the entire list shown by the defendant, with the exception of the twelve individuals and firms named in the second list, had been for a long time the regular customers of the complainants, and that at or near the places where these twelve new customers were doing business (except in one instance) the complainants had dealers or agents from whom, if the defendant had not been manufacturing these twelve parties could have obtained the rods. (Record p. 215.) Mr. Ely further testifies that, to his own knowledge, during all this period, no person or firm in the United States was making an equalizing device, and that no such device was anywhere on the market, except their own and the defendant's; that they had no competition with any one except the defendant during all this time. (Record, p. 216.)

Second. The defendant was also called upon to produce statements showing the total number of rods made and sold by him from April 8th, 1882, the date he commenced making his infringing articles. This statement is shown as Exhibit No. 3, on page 196 of the Record, and includes all that he made and sold, down to the first hearing before the Master. The total number of sets

shown in this statement, omitting those which he calls the "Stringfellow pattern," is 9,736. In his statement, Exhibit No. 5 (Record, page 196), is shown the amount of material used by him in his manufacture. He says that the first two items there shown, to wit: 22,083 pounds and 34,270 pounds, were $\frac{1}{2}$ inch steel, and the other items, amounting in the aggregate to 6478 pounds, were $\frac{5}{8}$ inch and larger sizes. If we divide the number of pounds used in making the $\frac{5}{8}$ inch rods, to-wit: 6,478 pounds, by 5.1 pounds which Ely says (see complainants' exhibit No. 1, Record pages 154 and 175) is required for one average set, we have as the result, 1270 sets of $\frac{5}{8}$ inch rods. Deducting these from the total rods shown in defendant's Exhibit 3, we have a balance of 8,466 sets, which are $\frac{1}{2}$ inch rods. Separating the kinds of rods shown in defendant's Exhibit No. 2 (Record, page 196), we have 1451 $\frac{1}{2}$ inch rods, and 3,093 sets of $\frac{5}{8}$ inch and larger sizes. Then, using the defendant's other statements which appear in the Record, we find the following total:

Exhibit 3, $\frac{1}{2}$ inch steel rods, - - - -	8,466 sets.
Exhibit 3, $\frac{5}{8}$ inch steel rods, and larger, -	1,270 sets.
Exhibit 2, $\frac{1}{2}$ inch steel rods, - - - -	1,451 sets.
Exhibit 2, $\frac{5}{8}$ inch steel rods, and larger, -	3,093 sets.
Exhibit 6, $\frac{1}{2}$ inch steel rods, - - - -	35 sets.
Exhibit 6, $\frac{5}{8}$ inch steel rods, and larger, -	642 sets.
Exhibit 3, rods of the "Stringfellow form," -	611 sets.
Total reported, October, 1887, as made since his last report, - - - - -	1,034 sets.
Total, -	16,602 sets.

This is the amount, also, which is reported by the Master. (See Master's report, Record p. 208.)

Referring now to complainants' Exhibit No. 1 (Record page 154), it will be seen that the average cost of each set of ½ inch rods was 20.2 cents. The testimony as to manufacturer's profit on each set is conflicting. Mr. Ely puts it as low as 15 per cent. The highest estimate made by any witness is 50 per cent. Allowing this highest estimate, to wit: 50 per cent., and adding it to the average cost of each set, we have, for such average cost, with manufacturer's profit added, the sum of 30.3 cents per set. This is the average cost of each set of the ½ inch rods. The selling price of those rods (complainants' Exhibit No. 1, Record page 154) was 90 cents per set, and, deducting the cost and manufacturer's profit from that, we have a profit to the complainants of 59.7 cents per set, which complainants would have made if they had sold the rods manufactured and sold by the defendant.

The ⅝ inch rods and larger sizes, according to the same exhibits, cost, for labor and material, 22.75 cents. Adding to this a manufacturer's profit of 50 per cent. will make the total cost of each set, 34.125 cents per set. These also sold for 90 cents per set, giving the complainants a profit of 55.875 cents per set. Applying these profits per set to the total number sold of each kind, we will have the following result:

8466 sets ½ inch rods at 59.7 cents per set, -	$5,054.20
1451 sets ½ inch rods at 59.7 cents per set, -	866.25
35 sets ½ inch rods at 59.7 cents per set, -	20.90
611 sets "Stringfellow form," - - -	341.39
1034 sets made since last report, - - -	577.75
1270 sets ⅜ inch rods and larger, at 55.875 cts. per set, - - - - -	709.60
3093 sets ⅜ inch rods and larger, at 55.875 cts. per set. - - - - - - -	1,728.17
642 sets ⅜ inch rods and larger, at 55.875 cts. per set, - - - - -	358.70
Total profits,	$9,656.96
To this should be added the sum of $754.65, being the damage caused by the enforced reduction of price, - - - -	754.65
Total,	$10,411.61

From this should be deducted the profits on 1307 sets, being the number of sets, as we have heretofore shown, which the defendant sold to the twelve parties who had never been customers of the complainants. Computing the profit on these sets at only 55.875 cents per set, we have $730.28 to be deducted from the total amount above shown, to-wit: $10,411.61, leaving a balance of $9,681.33 as actual damages suffered by the complainants from the infringing acts of the defendant.

The items in the above statement, to-wit: 611 sets of the "Stringfellow pattern," and 1034 sets made by the defendant since his last report to the Master, and the 1307 sets sold to customers who had not been customers

of the complainants, have all been figured at the lowest profit as if they were all $\frac{3}{8}$ inch rods. Probably most of these were $\frac{1}{2}$ inch, and should have been figured at the higher rate, but, as there was no testimony showing the kind of rods, we have given the defendant the benefit of the lowest profit to which the complainants would be entitled.

The Master in his report, found the complainants' damages to be $8,380.51, and this amount the Court decreed to the complainants. We say, upon the foregoing statement of the facts as shown by the Record, that the complainants are entitled to at least the sum of $9,681.33, instead of the amount named in the decree.

Third. The complainants in the Court below, on the coming in of the Master's report, filed a motion, *under sections 4919 and 4921*, U. S. Revised Statutes, asking the Court to increase the actual damages and to render a decree for such increased damages. The sections above referred to give full power to the courts to inflict punitive damages, where the circumstances of the case seem to demand it. They may exercise that power by entering a judgment or decree for any sum above the amount of the verdict, or the finding of the Master, not exceeding three times that amount. The complainants claim that the Court below should have exercised that power in this case, because the defendant's infringement was deliberate and intentional, and because he had con-

tinuously for years acted in bad faith towards the complainants. This power, according to the Statute, is to be exercised "according to the circumstances of the case," and has been exercised by courts in many instances where the defendant's infringement has been deliberate and intentional.

In Russell vs. Place, 9 Blatch. 173, the verdict was for $700.00. The Court say:

"Besides this, where the Court has power, and is called upon, to grant treble damages, this excess may be considered, and, in the discretion of the Court, the error may be fully corrected by such enhancement of damages as may seem just, to indemnify the plaintiff for the expenses of prosecution, *especially where, as in this case, the infringement seems deliberate and intentional.*"

The Court in that case increased the damages to $1200.00.

In the case of Peek vs. Frame, 9 Blatch. 194, the plaintiff received a verdict for $5,000 00. On a motion to increase the damages, the Court, by Judge Woodruff, says:

"I regarded the conduct of t e defendants, as disclosed on the trial, as peculiarly aggravated, and find no reason for changing my opinion. The damages ought to be increased by a sum sufficient to cover the expenses of the trial, and something more, for the time and trouble of the plaintiffs. Let the damages be increased to $7,500.00."

See also Brody vs. Mining Co., 4 Fisher's Patent Cases, 137.

That the defendant's infringement, in this case, was wilful, deliberate and intentional is clearly shown by the testimony. He was, for a long time prior to his engaging in the manufacture of this device, in the employ of the complainants as their sales agent for this device; the first rod he ever saw in practical use was the Topliff & Ely rod; he had knowledge of their patents covering this device, long before he commenced manufacturing, and knew the complainants were the sole and exclusive manufacturers of the same in the United States, under the patents owned by them; that they had granted no licenses to others to make and sell this device; and with all that knowledge, he left their employ, set up a manufactory for this device in Cleveland, and at once commenced to make and sell the identical device of the complainants; he was notified by the complainants to desist, but without avail, and so, in order to protect themselves in their manufacture, the complainants brought this suit; that during the whole period since the beginning of this suit, the defendant wilfully has continued to manufacture and sell this device at prices below those of the complainants, 170, and this with full knowledge on his part, according to his own confession, that he was making and selling them at a great loss to himself, 158, 170; that after the rendition of the decree in this case, and the allowance and service of an injunction against him, he still, in defiance of complainants' rights and in defiance of the orders of

the Court, continued the manufacture and sale of this device (see Record, pages 25, 40 41, 44, 46, 91, of original testimony; also pages 158-160, 167-8, 170, of testimony before the Master).

When the defendant was asked why, with full knowledge, on his part, of complainants' rights under their patents, he persistently continued to make and sell this device, his only excuse was that it enabled him to more readily sell another article of his manufacture. (Record pp. 158, 159, 170.)

When he was before the Master, he testified that he made and sold, after the decree of the Court against him was rendered, and after the injunction had been served upon him, 611 sets of equalizers of the kind he calls the "Stringfellow pattern" (see Record, pages 164, 167). The interlocutory decree of the Court below provided that the defendant might fill any bona fide orders he might have received up to the time of the decree, and an injunction was allowed, preventing him from making and selling any equalizers for which he had no orders at the date of that decree (Record p. 148.) It is not claimed by the defendant, nor does the testimony show that he had received any orders which included these 611 equalizers made by him, as above described. His only claim was that they were not covered by either of the complainants' patents.

He produced four exhibits, as showing the different forms of these new equalizers. The only difference in

form appeared to be an extension of the two shackles above the connecting rod, by which they were to be clipped to the axle of the buggy. It was not claimed by him that they were for any other purpose than that of equalizing the springs, or that he used this form for any other purpose than to evade the literal description of the complainants' device. It was shown by experts that all that was necessary to make them exactly like the complainants' device was to clip off the upper part of the shackle, and even that was not necessary, for if the clips were placed between the main rods, upon the shackles, it would make the complainants' device precisely. (See Record, pages 168-9, 179-80.)

It further appeared in the testimony before the Master, that the defendant made other equalizers, for which he had no orders at the time the interlocutory decree was entered (Record, page 168), and that a number of orders which he received after the decree was entered, were also filled (Record, page 168).

On this state of facts, it cannot be claimed for the defendant that he acted innocently or ignorantly, or without intention of violating the orders of the Court, or the rights of the complainants. The Master, in his report (Record, p. 206), found as a fact, that the defendant "embarked in this enterprise with full knowledge of the complainants' patents, of their facilities for the cheap, rapid and profitable manufacture of these equalizers, of

their mode of doing business, and how to reach their customers. His infringement, therefore, was not accidental, or in ignorance of complainants' claims and rights. He must have calculated the risks, and knowingly assumed the responsibilities attending his venture."

The complainants, therefore, insist

First: That they are entitled to a decree against the defendant for $9,681.33 as actual damages suffered by them by reason of the infringing acts of the defendant.

Second: That the infringing acts of the defendant were of such wilful, deliberate and intentional character as to entitle the complainants to an increase of damages, under the Statute referred to.

HENRY S. SHERMAN,
Solicitor for Complainants.

Office Supreme Court U. S.
FILED,
JAN 26 1892
JAMES H. McKENNEY,
CLERK.

IN THE

Supreme Court of the United States.

OCTOBER TERM, 1891.

ISAAC N. TOPLIFF, APPELLANT,
vs.
JOHN A. TOPLIFF, AND
GEORGE H. ELY, RESPONDENTS.
NO. 220.

JOHN A. TOPLIFF, AND
GEORGE H. ELY, APPELLANTS,
vs.
ISAAC N. TOPLIFF, RESPONDENT.
NO. 277.

Brief in Behalf of Isaac N. Topliff.

W. W. BOYNTON,
JOHN C. HALE,
M. D. LEGGETT,
SOLICITORS FOR ISAAC N. TOPLIFF.

WHITWORTH BROS., PRINTERS, CLEVELAND, O.

IN THE

Supreme Court of the United States.

NOS. 220, 227.

ISAAC N. TOPLIFF,
vs.
JOHN A. TOPLIFF AND
GEORGE H. ELY.

BRIEF FOR APPELLANT.

STATEMENT OF CASE.

The appellees brought an action in the Circuit Court for an injunction to restrain the appellant from infringing certain letters patent, and for an accounting, and for damages resulting from the infringement.

They alleged that they were owners, by assignment, of the letters patent issued by the United States to John B. Augur, October 11th, 1870, for "a certain new and useful improvement in gearing for wagons," No. 108,085; that said patent, together with all claims for damages and profits ac-

crued by reason of infringement of the same, was, on February 10th, 1873, assigned by Augur to one Charles Atwater, and by Atwater on the 9th day of February, 1883, together with all claims for damages and profits accrued by reason of infringement of the same, to Cyrus W. Saladee; and that Saladee, on April 9th, 1884, assigned to the appellees, "his entire right, title and interest in and to said patent and invention."

They further alleged that on the 20th of February, 1872, said Cyrus W. Saladee secured letters patent from the United States, No. 123,937, for "an improvement in carriage springs and their mode of attachment," which on the 17th day of February, 1883, was assigned by Saladee to the appellees; and that on the 19th day of December, 1878, the United States granted letters patent to the appellees, John A. Topliff and George H. Ely, for a new and useful "improvement in connecting carriage springs," No. 122,079, which patent, on the 9th day of February, 1872, they surrendered to the commissioner of patents, and received new letters, Reissue No. 4857, for the same invention, and in accordance with a corrected specification, and that on the 28th day of March, 1876, upon a surrender of the reissued letters, numbered as aforesaid, new letters patent Reissue No. 7017, for the same invention, in accordance with a corrected specification were issued to them.

They further alleged that since said patent was granted to said Augur, and since the said patent granted to said Saladee, and since the reissued letters patent granted to the appellees, the appellant has made, used and sold all said ininventions in violation of complainants' rights, and they prayed as above stated.

The appellant, by his answer put in issue all the allegations of the bill except the facts that said patent, and said reissued letters patent, were granted as alleged in the bill; and affirmatively set out that neither of them was of any validity, because of want of novelty, and because of anticipations; alleging that they had been anticipated by patent No. 842, issued to Jones Eells and Griswold, July 16th, 1838, by letters patent No. 31,134, issued to C. C. Stringfellow and D. W. Surles, January 15th, 1861, by letters patent No. 81,217, granted to C. M. Sexton, August, 1868, by letters patent No. 84,316 granted to A. C. Stowe, November 24th, 1868, by letters patent No. 85,114 granted to A. C. Stowe, December 22d, 1868, and by letters patent No. 118,452 granted to Benjamin Hershey, August 29th, 1871. The appellees filed a general replication. On the trial the complainants gave in evidence certain models of the various alleged inventions, and certain exhibits showing the granting of the letters and reissued letters patent named in the complainants' bill, which are more particularly referred to on pages 12 and 13 of the record.

They also gave in evidence a certified copy of the assignment of patent No. 108,085, from Augur to Atwater, and from Atwater to Saladee, and from Saladee to the complainants, which assignments are found on pages 18, 19, 20, 21 and 22 of the record, and show that the assignment from Augur to Atwater was to secure a loan of two thousand dollars, the debt and patent being assigned by Atwater to Saladee, which debt, from anything that appears in the record, was never paid. Evidence was also given, pages 21 and 22, of the assignment of the Saladee patent No. 123,937 to Topliff and Ely, (see record, pages 26 and 27.)

On the trial, the court found that the Augur patent No. 108,085 and the complainants' reissued patent, No. 7017, were valid patents, and that the defendant had infringed the same; referred the case to a master to take testimony and report to the court the amount of profits that the respondent had realized from the manufacture and sale of the invention so found to be valid, and the damages that the complainants had sustained by reason of such infringement.

The master made his first report, found on pages 151, 152 and 153 of the record, to which exceptions were filed, set out on page 198 of the record. The court set the report aside for error in the finding as to the amount of damages, and re-referred the same to the same master for a new report, which was made, and to which exceptions were filed and over-ruled and judgment given thereon. The last report of the master is found on pages, 205, 206, 207, 208, 209 and 210 of the record. The master found that the appellant had realized no profits from the manufacture; but that the complainants were damaged to the extent that they would have supplied the trade of the appellant, which he found to be eighty per cent. of that trade, for the years 1882, 1883, 1884, 1885, and ascertaining the number of sets of equalizers that the respondent had sold for those years, gave to the complainants the difference between what it would have cost them to make the equalizers, with a small manufacturer's profit added to that sum, and what they were selling them for, during those years, in the market, making the total $8,480.51, for which the court gave judgment.

There was no evidence offered tending to show what damages Atwater had sustained by the respondent's infringement of patent No. 108,085, prior to April 9th, 1883, when the

same was assigned to Saladee. And there was no evidence offered tending to show what damages Saladee had sustained by reason of respondent's infringement of the same, between April 9th, 1883, and April 9th, 1884, during which period said patented invention was owned by Saladee. There was no claim made in the bill for damage sustained by, or for profits accrued to either Atwater or Saladee before the assignment of the Augur patent to the complainants on April 9th, 1884; nor did the complainants' bill seek to recover any damages which had arisen before the assignment of the Augur patent to them for its infringement. All the evidence in the case on the subject of damages had exclusive reference to proving how many of the equalizers manufactured by the respondent would have been made and sold by the complainants during the years 1882, 1883, 1884 and 1885, and what it would have cost them to make the same; and what profit they would have realized had they made and sold the same; and the master gave the complainants the benefit of sales made by the respondent to the extent of more than six thousand dollars, made in the years 1882 and 1883 and 1884, before they had acquired the least interest in the Augur patent.

ASSIGNMENTS OF ERROR.

First:—The court erred in finding the equity of the case with the complainants.

Secondly:—The court erred in finding letters patent exhibited in the (record, pages 14 to 15,) issued to John B. Augur, dated October 11, 1870, No. 110,085 to be valid, and in sustaining the same. (See decree, record page 145.)

Thirdly:—The court erred in finding the reissued letters patent to the complainants, exhibited in the record (pages 31,

32, 33), dated March 28th, 1876, No. 7017, to be valid, and in sustaining the same; because, 1: As respects said reissued patent, No. 7017, in view of the state of the art it has no patentable feature about it, but is a duplicate of and was anticipated by said patent No. 108,085, issued to John B. Augur October 11th, 1870, as above set forth.

2:—Said reissued patent No. 7017 is void, because its claim is for another distinct invention from the one claimed by the original patent No. 122,079, and was granted on specifications identical in meaning with reissue 4857.

3:—Said reissue is also void because there was no "inadvertence, accident or mistake in the specifications therefor," as required by §4,916 of the Revised Statutes, to justify or authorize a change or modification in the claim made in the original letters patent.

Fourthly:—As respects both said patent No. 108,085 issued to said Augur, and said reissued patent No. 7017, issued to complainants they are both invalid, 1st, for want of novelty; and 2d, because anticipated and covered by the letters patent issued to Stringfellow and Surles, January 15th, 1861, No. 31,134, exhibited on pages 70 and 71 of the record.

Fifthly:—There was and is manifest error in both the basis adopted therefor and in the estimate of damages.

1st:—Because the master adopted, as the basis therefor, the number of equalizers that he found complainants would have manufactured and sold of those manufactured and sold by the respondent during the years 1882 and 1883, and up to April 9th, 1884, before the assignment of the Augur patent to them, as well as what the complainants would have sold

after that date and prior to April 9th, 1884, adopting as a rule to determine the amount, the difference between the cost of manufacture by plaintiff's and their selling price, deducting therefrom a manufacturer's profit. The respondent could be made liable to *Atwater* only for those sold prior to April 9, 1883, and to *Saladee* only for those sold between April 9th, 1883, and April 9th, 1884, or to the complainants had their suit by proper averment sought recovery on the claims assigned for damages for prior infringement, in which case, however, their recovery would have been limited to the damages sustained by Atwater and Saladee for such infringement. The court proceeded on the false assumption that the complainants were the owners of the Augur patent during the years 1882, 1883 and 1884 prior to April 9th, as well as after, overlooking the fact that they had owned it only from April 9, 1884. Hence damages for nearly two years and a half of the alleged infringement wrongfully went into the judgment.

ARGUMENT.

The Topliff & Ely Reissued Patent No. 7017 Invalid.

We claim, First:—The Topliff & Ely patent reissue No. 7017 is invalid because, in view of the state of the art, it embodies no invention.

Secondly:—The claim of the original patent was so enlarged and broadened by this reissue as to invalidate it if otherwise valid.

Thirdly:—It was granted on the same drawings and specifications on which reissue No. 4857 was granted.

And Fourthly:—It was clearly anticipated by both the

Augur patent No. 108,085 (record, page 14) and by the patent to Stringfellow and Surles No. 31,134 (record, page 71).

We shall not argue the first of these propositions to any extent, but content ourselves with a brief discussion of the last three.

The complainants, in their application for the original patent (see record, page 27), made it known that they had invented "certain improvements in connecting carriage springs," and made a statement of the nature and object thereof, exhibiting a drawing in connection therewith, showing its various parts. This patent they surrendered to the proper office and obtained a reissue No. 4857, which in turn they surrendered and obtained another reissue, No. 7017. which the Circuit Court held to be valid.

We give here the specifications of the three patents, the original and the two reissues, with their respective claims, in order to render comparisons between them more convenient. The specifications for reissue No. 4857 were identical with the specifications for reissue No. 7017 with the exception that the word "wheels" in the former was made to read "wheel" in the latter, an unnecessary correction of what manifestly was a mere typographical error.

ORIGINAL 122,079.

The nature and object of this invention, are to *so connect the springs on a carriage* or other vehicle, that they act together, that is, *the motion up* or *down* of either *shall be conveyed to* the other, thereby dividing the strain and preventing either side of the carriage from being depressed more than the other.

REISSUE 4857.

Our invention relates to side half-elliptic spring vehicles, and has for its object, suspending the front and rear ends of the springs directly to the rear axle and front bolster of the running gear by means of two separate connecting rods, the outer ends of which have formed upon them as a part of the same, and at right angles with the rod, short arms, between which,

the ends of the springs, respectively, are secured and operated, the connecting-rod receiving the rear ends of the springs, being hinged to the rear axle, while the rod receiving the front ends of the springs, is in like manner, connected to the front bolster in such manner that the vibration of the springs will impart a corresponding rotation to the connecting-rods front and back, and so that the depression of either spring will, by the rotary action, imparted to the connecting-rod, compel a corresponding depression of the other, and thus compel both springs to vibrate together, and move in unison one with the other, equalizing their action, and the weight imposed upon them, as well to prevent side motion to the body of the vehicle.

We are fully aware that to attain the object hereinbefore recited, by means of connecting-rods placed at right angles across the front and rear of the running-gear of vehicles, and hinged to the front bolster and rear axle, or upon perches, and in close proximity to the bolster and axle, is an old device, and which is no part of our invention.

We deem it proper in this connection, to cite the instance of prior use of connecting rods for the purpose of equalizing the load imposed upon the springs of vehicles, as also the equalization of the action of the springs, so far as known to us, the better to illustrate the distinctive difference between our invention and all others pertaining to the use of the connecting-rod for the purpose specified.

The first instance we cite is the patent granted to Joshua Jones, Allen M. Eels and Horace Griswold, No. 842, and dated the 16th day of July, 1838. In this patent

ORIGINAL 122,079. REISSUE 4857.

is clearly shown two separate connecting rods, one hinged to the hind axle and rear end of the body, and the other to the front bolster and front end of the body, and arranged in combination with a coiled or scroll spring, located about midway between the front bolster and rear axle.

Secondly, we cite the rejected application for a patent of Eli Petteys, rejected upon the patent last above cited, on the 27th day of July, 1850. Here also two separate connecting-rods are shown, one across the front and one across the rear of the running-gear, but no side-springs are shown in the combination therewith. The third and fourth we cite in the two several patents granted to Anson C. Stowe, dated November 24, 1868, and December 22, 1868. In both of these patents two separate connecting-rods at right angles across the running-gear are shown and described, the one in connection with C springs, and the other with side springs, but in the last-named case the connecting rods are not connected directly with the ends of the springs. And finally, the last case we cite is the patent granted to John B. Augur, No. 108,085, and dated the 11th day of October, 1870. In this patent side-springs are used, the front ends of which are hinged upon fixed and rigid standards, secured upon the top of the front bolster, and where the front ends of the spring are firmly held in a central position over said bolster, while the rear ends are hinged to hinges secured to the outer ends of a single connecting-rod, placed over the top of the rear axle in such a manner that as the springs are lengthened by depression, a corresponding rotation is imparted to the connecting-rod. In this case,

ORIGINAL 122,079. REISSUE 4857.

provision for lengthening of the springs when depressed or in motion, is only made for the rear ends of the springs. the front ends being firmly held over the center of the bolster, and hence, as the load upon the springs is increased, and as only their rear ends in combination with said links and connecting rod, are permitted to accommodate their vibration, the rear end of the body is caused to have a backward tipping motion, that is, the back end of the body is thrown lower than the front when the springs are depressed to their full capacity, which is an objectionable feature in this device, for equalizing the action of springs. Besides, as only the rear ends of the springs are allowed to act, that easy and natural motion of the springs, which is only had by allowing both ends to act freely, is in a in a great measure lost.

The radical difference of our invention from each and all of the cases above cited is, first, in the construction of the connecting-rod; and secondly, in suspending both ends of the springs upon separate connecting-rods, and thus allow both ends of the springs to act freely and in harmony with their vibrating motion, to which is added the other important advantages, viz., that our arrangement of connecting-rods admits of their application to side-spring vehicles of the ordinary kind now in use, as readily as to those built expressly for the purpose—an advantage not attained by any other previously known combination of connecting rods with the springs or bodies of vehicles.

In the drawings, Fig. 1 represents a top view of the hind axle, perches and front bolster of a

Fig. 1 represents the springs of a carriage and their attachments. Fig. 2 the connecting-rod.

ORIGINAL 122,079.

A A and A' A' are the springs, B the connecting-rod which turns freely in clips D D. C C and C' C' are the arms by which the springs A A and A' A' are attached to the connecting-rod B.

D D are clips which attach the connecting rod B to the gearing of the carriage.

The arms C C C' C' are rigidly fastened to the rod B, so that when the spring A lengthens or contracts, thus causing the arms C C to move, the same movement will be transmitted to the arms C' C', which will cause spring A' to lengthen or contract likewise and *vice versa*.

It will be observed that the position of each rock-rod B B' is just in front of each axle and secured by the clips D; and that the arms C C C' C' are fixed to said rock rods B B' on each side of said clips D; and that the springs A A' are secured between the inner ends of these arms, so as to be braced laterally and allow both the front and rear ends of the springs to yield in unison with each other. By this arrangement, the seat is allowed to yield in both directions without rolling, the position of the arms being always downward, those of each rock-rod, while moving together, can also move with each separate rod independent of the other.

What we claim is:

REISSUE 4857.

carriage running-gear and Fig. 2 is side view of the same.

A A and A' A' are the springs, B B' the connecting-rods which turn freely in the bearings, D D D D; C C and C' C' are short arms formed upon the outer ends of the connecting-rods by being welded or otherwise fastened thereto and made part of the same and between which the ends of the springs are secured and operated by a passing bolt, as clearly shown in the drawing.

D D are the bearings which attach the connecting-rods to the rear axle and to the front bolster.

The arms C C C' C', being formed solid with the connecting-rods, when spring A vibrates so as to lengthen or contract, causes the arms C C to move accordingly, when the same movement will be transmitted through the connecting-rod to the arms C' C', which will cause the opposite spring A' to lengthen or contract in like proportion, or nearly so, the same as spring A.

With the several parts combined, arranged and operating, as clearly shown and described, it is self-evident that both the front and rear ends of the springs must act freely upon their suspended bearings between the arms C C' of the connecting-rods B B' under the pressure of the weight imposed upon them, and in unison with each other; and the position of the arms being always downward at their outer ends, those of each connecting-rod, while moving together, can also move with each separate rod independent of the other, as when a greater proportion of the weight carried is nearer the front or rear end of the springs, or as, when the front wheels strike an obstacle in the road which is missed by the hind ones, or *vice versa*.

We claim:

CLAIM.

ORIGINAL 122,079.

The arms C C C' C' arranged upon separate *rock* rods B' B', secured directly to the *front* and *rear axles*, to cause both ends of *each spring* to yield simultaneously and in unison with each other, *and also to be laterally braced by said rock-rods*, as described.

CLAIM.

REISSUE 4,857

The arms C C C' C', arranged upon separate *connecting* rods B B', secured directly to the *hind axle* and *front bolster*, to cause both ends of *the side springs* to yield simultaneously and in unison with each other, *in the manner shown* and described.

CLAIM.

REISSUE 7,017.

1st.—The combination of two connecting rods located at the front and rear ends of a wagon-body, and arranged to turn in their bearings with a pair of half elliptic springs, whereby the springs are caused to yield in unison with each other, substantially as and for the purpose set forth.

2nd.—The combination of the connecting-rods B B', provided with arms at their ends, with the half-elliptic springs, A A', substantially as, and for the purpose set forth.

The original patent of Topliff & Ely, No. 122,079, in stating the object and nature of the invention set them forth in language sufficiently broad and comprehensive to indicate that at the time of the application for such patent, they considered themselves entitled to a patent embodying any mode of connecting the springs of a vehicle so as to make them act in unison, and "prevent either side of the carriage from being depressed more than the other."

It would seem evident from their endeavor to distinguish their invention from other similar ones shown by their application for a reissued patent, that certain references were cited against them and their claim, and that they accepted the claim of the original patent as being, in view of such reference, all that they were entitled to. Shortly after the issue of the original patent, they discovered that the claim of

the patent was of too limited a character, and also that it contained a misstatement in the words "rock-rods B B' secured directly to the front and rear axles." The rod cannot be directly secured to the front axle and perform good service, and while this wording undoubtedly was a mistake, and if in due time discovered, one which the inventors had a right to correct by a reissue, yet they had no right to enlarge their specifications or drawings; and much less had they the right to enlarge the scope of their claim. Lateral bracing was a part of the original claim, found in the language "and also to be laterally braced by said rock-rods as described."

It will be seen upon reference to the above recited claims, that the claim of the reissue No. 4857 has no such limiting phrase, and that inasmuch as it has no such phrase, or one of equivalent import, its omission in the reissue is an enlargement of the original claim. It is an enlargement as well as a correction, because it embodies or embraces any rock-rod whether acting as a brace or not. In order to show ground for the first reissue, the inventors, in the specification therefor, in setting forth the object and nature of the alleged invention limited themselves to peculiar and particular constructions, combinations and modes of attachment of parts, thereby showing that they recognized the fact that this portion of the specification of the original patent was too broad.

They confined themselves in the specifications and altered drawings, to a particular construction and location of parts, and in view of their knowledge of the prior art, and the action of the Patent Office Officials, they accepted the claim as it is in reissue No. 4857, which, while broader in its scope than the claims of the original patent No. 122,079, is

still more or less limited to peculiar construction, combination of parts and mode of attachment.

Shortly after the first reissue of the original patent, an application was made for another reissue in which two claims were asked for and granted, both claims being much broader in their scope than the claim of the original patent, or the claim of the first reissue. It will be noticed as above stated that no change was made in the specifications or drawings, between the two reissues, except that the word "wheels" in reissue No. 4857 was made to read "wheel" in the last paragraph of the specification for reissue No. 7017. So that the two claims of reissue No. 7017 were asked for and granted on the same specifications and drawings as was the claim of the reissue No. 4857. This claim of the first reissue No. 4857 was all they sought to protect, and it was allowed upon their definite application therefor. Accepting the same, as covering the extent of their invention they had no right subsequently with identically the same specifications and drawings as set forth in reissue 4857 and without any corrections whatever in either of the same: not showing on the face of the patent any trace of mistake as between the two specifications or drawings, to apply for and secure claims embodying in their scope much more than was embodied in the claim of either the original or the first reissue.

The claim of the original patent Number 122,079, restricts the construction embodied by it to:—

a Peculiarly constructed arms C C C' C' arranged upon separate rock-rods.

b. Rock-rods B B' secured directly to the front and rear axles in such a manner as to cause both ends of each spring to yield simultaneously and in unison with each other; these same rock-rods acting as lateral braces for the springs.

The claim of reissue No. 4857 restricts the construction embodied by it to:—

a. Peculiarly constructed arms C C C' C' arranged upon separate connecting rods.

b. Connecting-rods B B' secured directly to the hind axle and front bolster in such a manner as to cause both ends of the springs to yield simultaneously and in unison with each other.

The difference between the claim of the original and the first reissue is that in the original patent the claim states that the rock-rods "are *secured directly to the front and rear axles*," while in the reissue it states that the connecting-rods are "*secured to the front bolster and rear axle*," nothing being stated in the claim of the reissue concerning the action of the rock-rods as lateral braces for the springs.

The first claim of reissue No. 7017 embodies the following construction:—

a. Two connecting-rods located at the front and rear "ends" of a "wagon body."

b. Suitable bearings for the rods to turn in.

c. A pair of half-elliptic springs.

d. All of the above combining to perform the function of causing the springs to yield in unison with each other.

It will be seen that the wording of the above claim does not restrict the connecting-rods to being secured to either axle or bolster, and that the element of half-elliptic springs is added. This is a plain and palpable enlargement of the original claim in nowise admissible under the specifications and drawings.

The second claim of reissue No. 7017 embodies the following constructions:

a. Connecting-rods B B'.

b. Arms on connecting-rods at their ends.

c. Half-elliptic springs A A'.

This claim, while more restricted in its terms than claim 1, is still much broader than the claim of the original or first reissue inasmuch as it leaves it optional as to how or where either the springs or rods are connected, so that they operate substantially as described, viz: in unison.

This court has repeatedly said that where the original claim is enlarged or expanded by the reissue, that the reissue is void.

Miller vs. *Brass Co.*, 104 U. S. 355.

Johnson vs. *Railroad Co.*, 105 U. S. 547.

Powder Co. vs. *Powder Works*, 98 U. S. 126.

Mahn vs. *Harwood*, 112 U. S. 357.

The reissue must be for the same invention, and no new matter can be embraced in the specification.

Heald vs. *Rice*, 104 U. S. 749.

And this must be determined by the face of the instrument. *Ibid.*

Or, if there be no inadvertency, accident or mistake in drawing up original specifications, the reissue is void.

Mahn vs. *Harwood*, 112 U. S., 359.

Leggett vs. *Avery*, 101 U. S., 256.

Manufacturing Co. vs. *Ladd*, 102 U. S., 408.

Coon vs. *Wilson* 213 U. S., 276.

Such was the case here as the original specifications and drawings were a clearly sufficient foundation for the original claim; and the second reissue having been applied for and secured on the same specifications as reissue No. 4857, the patent commissioner was without jurisdiction to grant the

same as there was no "inadvertence, accident or mistake" in drawing up the former specifications nor any pretension that the claim embraced what the patentee had discovered was not new; facts, the existence of which are fundamental and a prerequisite to jurisdiction to grant the reissue. See cases *supra*.

To maintain the complainants' right to the enlargement of the claim of reissue No. 7017, would be a direct violation of the principle settled in *Miller* vs. *Brass Co.*, 104 U. S., 355, where the court say:

> "Now whilst as before stated, we do not deny that a claim may be enlarged in the reissued patent, we are of opinion that this can only be done when an actual mistake has occurred, not from a mere error of judgment, for that may be rectified by appeal, but a real *bona fide* mistake inadvertently committed, such as a court of chancery, in cases wherein its ordinary jurisdiction, would correct. Reissue for an enlargement of a claim should be the exception and not the rule."

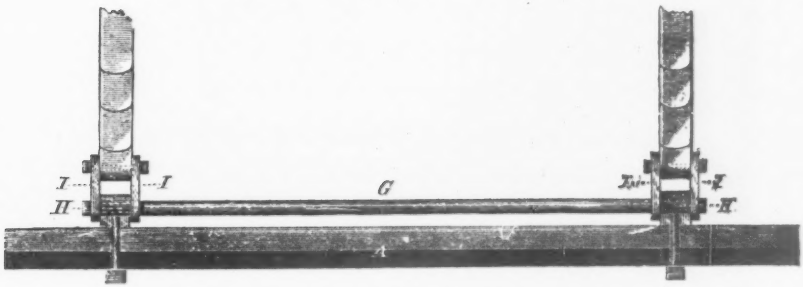
We humbly submit that there were no facts in the complainants' case to bring it within such exception. It was an effort to create and embrace new claims which were clearly anafter thought and widely variant from the original, and to secure such result without the pretense of error in the prior description or specifications. The language of the court in *Mahn* vs. *Harwood*, 112 U. S., 357, has a direct application. The court say: "It is clear therefore on the face of the patents that the only object of the reissue was to enlarge the claims. The description was not altered in the least. The claims in the original patent were clear and explicit, one of them being retained in the reissue. Nothing was altered, nothing was changed, but *to multiply the claims and to make them broader*." The reissue was held to be void. Here there was a third effort to secure something valuable, resulting only in an enlargement of the claim without even an excuse for not embracing it by the former reissue.

II.

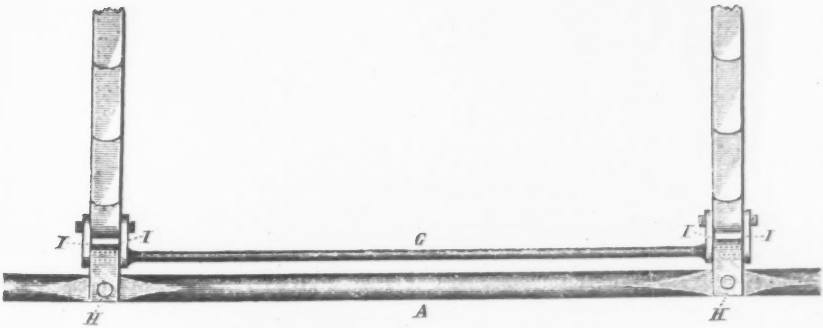
The Topliff & Ely Patent Anticipated by the Augur Patent.

We next claim that the reissued patent of Topliff & Ely, No. 7017, is void, as embodying no elements not embraced in the Augur patent No. 108,085, granted October 11th, 1870, (see record, page 14). The thing sought by the two inventions was identical, and to be accomplished by the same mechanical means. Little attempt was made by the complainants at the trial to establish any difference between these two alleged inventions. The following cuts describe the two.

Specification of Augur Patent No. 108,085.



Specification of Topliff & Ely Patent No. 122,079.



The specifications of the Augur patent describe an invention embracing and embodying the equalizing features of the device, in the clearest language. The description clearly shows it to have consisted in the connection of the two semi-elliptic side springs by a rigid connecting-rod having arms or links, to one end of which each spring was so attached that any movement of one spring and the link, would be communicated to the rod, and from the latter to the other link and spring securing similarity of action in the springs. So that the springs, in the language of the Topliff & Ely claim, would act "simultaneously and in unison with each other." The description in the Augur patent expressly stated that the construction of this equalizing device, might be changed. The means and method adopted and described for securing this similarity of action in the springs, plainly are links or arms, connected thereto by an equalizing rod or bar.

At page 15 of the record, is found Augur's statement of what his improvement consists. He says:

> "My improvement consists first, in connecting together by a rigid rod, the two pivoted links upon the clips employed upon the hind axle, so that when the weight is upon one spring, both springs, by reason of the connecting-rod, shall be caused to work together, thus preventing the roll."

He claimed, first:

> "The herein described method of equalizing springs of vehicles and distributing the weight of the load."
>
> Second, "The combination of the pivoted links of the rod connecting the same, with the rod compelling both links to move in unison as and for the purpose described."

In the specifications and drawings, (page 15 of the record) he says:

> "Fig. 1 represents a side view of my improvement, the springs being shown in two positions to show the action of my

improved clip connection. The rod which connects together the swinging links of the hind axle, is shown at G, clips being shown at H and the links at I. The rod G is turned down at each end to pass through the eyes of the links and through the clips, and is threaded at each extreme end to receive the nut g. This rod turns in its bearings in the clips, and the links having square or equivalent openings in their inner eyes to receive a correspondingly shaped portion of the rod. This insures a positive rocking of the rod upon its axis whenever either link is swung forward or backward by the action of its own springs, and positively compels, through the agency of the rod, the simultaneous and equal movement, and with positiveness of both the links, and as a consequence, an equal action of both springs of the vehicle, even though all weight may be upon one side. In short, one spring cannot act without forcing the same action upon the other, and hence, the weight is brought to bear upon both ends of the axle. Anything like a roll is prevented, and there is no undue straining or contorting of the springs, axle, or other parts. Instead of having the connecting-rod serve also as the axis for the swinging links, it may be made separately and connecting the links at a point above their centers of motion. I prefer, however, the construction shown, as it conduces to greater strength, security and certainty of action * * The dotted lines in Fig. 1 show the positions of the buggy body, springs, and pivoted links under the action of any weight, the springs and links of both sides of the carriage descending equally."

These specifications described with accuracy what Augur, as above stated, says his invention consists of; the connecting together, by a rigid rod, the two pivoted links upon the clips employed upon the hind axle, so that when the weight is upon one spring, both springs, by reason of the connecting-rod, shall be caused to work together.

Topliff & Ely, in their application for the reissue, stated their invention as follows, (page 31 of the record):

"Our invention relates to side half-elliptic spring vehicles, and has for its object suspending the front and rear ends of the springs directly to the rear axle and front bolster of the running gear, by means of two separate connecting-rods, the outer ends of which have formed upon, and as a part of the same, and at right angles with the rod, short arms, between which the ends of the springs respectively are secured and operated, the connecting rod receiving the rear ends of the springs being hinged to the rear axle, while the rod receiving the front ends of the springs is in like manner connected to the front

bolster in such manner that the vibration of the springs will impart a corresponding rotation to the connecting-rods front and back, so that the depression of either spring will, by the rotary action imparted to the connecting-rod, compel a corresponding depression of the other, and thus compel both springs to vibrate together and move in unison, one with the other, equalizing their action and the weight imposed upon them, as well to prevent side motion to the body of the vehicle."

In their application for the original patent, they stated, (page 27 of the record):

"The nature and object of this invention are to so connect the springs of a carriage or other vehicle, that they act together, that is, the motion up or down, or either, shall be conveyed to the other, thereby dividing the strain and preventing either side of the carriage from being depressed more than the other."

In their drawings, (page 33 of the record,) their description is as follows:

A A and A' A' are the springs, B B' the connecting rods which turn freely in the bearings, D D D D and C C and C' C' are short arms formed upon the outer ends of the connecting-rods by being welded or otherwise fastened thereto, and made a part of the same, and between which the ends of the springs are secured and operated by a passing bolt, as clearly shown in the drawing. A A are the bearings which attach the connecting-rods to the rear axle and to the front bolster. The arms C C C' C' being formed solid with the connecting-rods. When the spring A vibrates so as to lengthen or contract, causes the arms C C to move accordingly, when the same movement will be transmitted to the connecting-rods and the arms C' C' which will cause the opposite spring A' to lengthen or contract in like proportion or nearly so, the same as spring A with the several parts combined and arranged and operated as clearly shown and described. It is evident that both front and rear ends of the springs, must act freely upon their suspended bearings between arms C C' of the connecting rods B B' under the pressure of the weight imposed upon them, and in unison with each other."

The claim, by them stated in their reissue, No. 7017, is first:

"The combination of two connecting-rods located at the front and rear ends of a wagon-body, and arranged to turn in their bearings with a pair of half-elliptic springs, whereby the

springs are caused to yield in unison with each other, as and for the purpose set forth."

Second :—"The combination of the connecting-rods B B' provided with arms at their ends with half-elliptic springs A A' and substantially as and for the purpose set forth."

We respectfully submit, that an analysis of the foregoing claims and specifications shows that these two alleged inventions are the same, both in the object sought and in the manner and means adopted to attain that object.

Augur connects together, by a rigid rod, the two links upon the clips attached to the axle, so that when weight is placed over one spring, pressing it down, the other spring, through the rigid rods and links, goes down with it, proportionately, simultaneously, and in unison.

Topliff & Ely so connects the springs in a carriage by a rigid rod with short arms (links) that the motion up and down, of one spring, shall, by such rigid rod and arms, be conveyed to the other spring, bearing it down simultaneously, and in unison.

It would require rare powers of discrimination to distinguish a difference between these two things, or the means through which the object sought by both is accomplished. So of the respective claims.

Putting Augur's first two claims together, they in substance read: "I claim the combination of the pivoted *links* with the *rod connecting the same*, the rod compelling both links to move in unison, thereby equalizing the action of the springs to which they are attached and distributing the weight of the load."

Topliff & Ely claimed "a combination *of the connecting-rods provided with arms* at their ends, with *half-elliptic springs*

located at the front and rear ends *of a wagon body*, whereby the springs are caused to yield in unison with each other," The only difference between the two claims is, Augur attaches the connecting-rod to the hind axle, Topliff & Ely to the hind axle and front bolster. Although different words are used by Topliff & Ely in describing the links and the clips, they mean the same thing. Each spring in their description is connected to a swinging link called, arms, the links being connected by a rod or bar and the equalizing device attached to each end of the carriage, instead of the hind axle, as in the Augur patent. This additional attachment is the only difference. If the fact of the double attachment is attended with the least advantage to secure the result sought, it is mere duplication, which we respectfully submit is not patentable.

The reissued specifications of the Topliff & Ely patent show they did not regard their invention as involving a different subject matter from the Augur patent, or as embodying any essential difference in the mechanical means to be employed to secure the result of equalizing the action of the springs of a carriage, unless the mere duplication alluded to above establishes such difference.

For they say in their specifications, (page 30 of the record):

> "The radical difference of our invention from each and all of the cases above cited (including Augur's) is 1st: In the *construction* of the connecting-rods, and 2d: In suspending both *ends* of the spring upon separate connecting-rods, and thus allow both ends of the springs to act freely and in harmony with their vibrating motion."

This confession, in their statement of the difference between the two patents, clearly shows that their reissue specifications were based on false premises, and not because of any mere mis-

take or error or insufficiency in the specifications of the original patent, as the specifications of the original patent were clearly sufficient as a foundation for the claim made thereon. They made a seemingly adroit attempt to obtain the precise effect of the Augur patent, by the same or similar mechanical means or contrivance, and yet so to word the description of their invention, as to disguise the deception and escape detection. That the functions of both constructions of the two patents are the same, is undoubted. A change in construction is not invention as Augur provided for such change. The only difference there is between them, as above stated, is in the alleged suspension by Topliff & Ely of both ends of the springs and by Augur of the hind end only.

To utilize the Topliff & Ely alleged improvement, they must, of necessity, use the links and arms of the connecting-rods described and claimed in the Augur patent, the first claim of which embraces all that is shown in either end of the attachments described in the Topliff & Ely patent. A mere change of the position, or duplication of the attachments to the "wagon-body" as described in the Topliff & Ely patent, cannot be invention and must be held subordinate to the prior and paramount claims in the Augur patent.

Dunbar vs. *Meyers*, 94 U. S., 195.

Moreover, the fact that the Augur patent connects the springs to a connecting rod only at the rear end of the gearing, and that the Topliff & Ely patent connects their springs at both ends, is of very little importance; because Topliff & Ely confessedly make use of the Augur connection at the rear end of the carriage. They therefore clearly infringed Augur's connection, and infringing at one end, they infringed at both.

That Topliff & Ely were conscious that their patent was a fraudulent imitation of others appears from other considerations. They alleged in their bill that the respondent was infringing, by the articles he was manufacturing, not only their reissue 7017, but also the Augur patent, and the Saladee patent, No. 123,937, well knowing, as shown by the evidence, that the respondent made, and only made the article that the complainants themselves were making in accordance with the specifications of their reissue No. 7017. All the patents being for combinations resulting in the equalization of the action of the springs, and in that only, if the respondent was, as the complainants alleged, infringing by his manufacture, the Augur patent or the Saladee patent, it necessarily follows that their reissue was void, as both the Augur and the Saladee patents anticipated the Topliff & Ely reissue.

The Saladee patent, the specifications and claim of which were put in evidence by the complainants, (see record, pages 22 and 23), employed the same means and instrumentalities for the equalization of the action of the springs of carriage as were employed by Topliff & Ely, and his patent was obtained some years before the reissue of the complainants.

In this connection the fact should not be overlooked that the plaintiffs sue for the infringement of the Saladee patent as well as for the infringement of the Augur patent and of their own, well knowing, as clearly appears from the evidence, that the article manufactured which constituted the alleged infringement, was made in conformity only to the specifications of their own alleged invention; and knowing also that a suit for the infringement of a plurality of patents can only be sustained where the inventions covered by all the patents are embodied in the infringing manufacture.

Walker on Patents, §417.

They, therefore understood that their own patent, so followed in the infringing manufacture, was itself an infringement of the patents of both Augur and Saladee, if the latter two were valid inventions.

Furthermore, it was expressly found by the master particularly stated in his first report, (page 206 of the record), that the Augur invention and the Topliff & Ely invention were the same. He says: "In my former report I referred to the claim of the defendant that all the damages for which he is liable is for the value of the use of only that particular part of the equalizer which he contends has been held to be an infringement.

Complainants contend that their patent covered the method of equalizing springs by means of the combination of the rod and clips described in the patent. The *rod* and the *clips* are the only elements *which compose the whole device*; and the entire device is claimed by the patent." What more is wanted to make it manifest that the complainants reissue No. 7017 is void.

III.

BOTH THE AUGUR AND TOPLIFF & ELY PATENTS INVALID.

We further claim, that both the Augur and the Topliff & Ely patents held by Judge Welker, holding the Circuit Court, to be valid, are invalid, not only for want of novelty, but because they were anticipated long before the applications therefor were made by patent 31,134 issued January 15th, 1861, to Stringfellow and Surles, (see record page 70) as well as by patent No. 84,316, issued November 24th, 1868, to A. C. Stowe, (record page 72).

Testimony of mechanical experts was taken by the complainants to show that the principle and operation of the Stringfellow patent and those of Augur and Topliff & Ely were not the same, and by respondent to show that they were. In the opinion of the experts the only difference in the mode of action and operation of the Stringfellow, and the Augur and Topliff & Ely patents, was one of degree only.

The complainants' witnesses stated the difference to consist in what variations are found to exist between the operation or function of a shaft and a crank-pin in their connection with other parts of the mechanism; their opinion being, that power was communicated in the Augur device and in that of Topliff & Ely, from one spring to the other by means of the shaft, and in the Stringfellow device by means of a crank-pin; and the complainants claim the discovery of the advantage resulting from this difference, to be invention, and consequently to destroy the claim that the Stringfellow device anticipated that of Augur, and that of Topliff & Ely. Both these positions we deny.

The weight of the testimony, when the skill and knowledge of the witnesses are considered, was clearly to the effect that the principle of the two devices was the same by whatever names particular parts of the combination may be called. All agree that the two devices have the same operation and produce the same equalizing result when the connecting-rod of the Stringfellow device is enlarged in size.

The witness Warner, by far the most skillful and intelligent of the witnesses and the better educated, having before him the models of the Stringfellow and the Topliff & Ely in-

ventions, the first being defendant's model "B" and the second being complainant's model "A", says:

> "It would seem to me that in both models the entire virtue, as far as the claims are concerned, must be in the rigidity of the connecting-rod. It is subject to torsion in each case and in the same manner, and in each case a pressure by the weight of the body of the wagon has a tendency to elongate the springs as it strikes it. This then, is communicated, by means of this rigid connecting-rod in Ex. "B" and in Ex "A", to the opposite side."

At page 48, in answer to the question: "wherein the two inventions differ in their operation, or wherein two carriages built after the models differ in their operation," he says:

> "It seems to me that in principle they differ none at all. In construction they differ in a small measure, which is in the proportion of the length in this model (Ex. "B") as it is shown here. This C-shaped jack may be elongated a little and it makes the proportion in construction exactly the same. The difference now between complainants' Ex. "A" and defendant's Ex. "B" is merely a matter of proportion. *The principle is exactly the same*, but the *construction* is a little different, in the fact that the spring in defendant's Ex. "B" is proportionately longer than in complainants Ex. "A". It is merely a matter of proportion and not of principle. Cut off this connecting-rod in each case, and you have the old fashioned carriages * * * The only feature in which either of these differs from the bending spring, which has for years been in use, is in having this cross-connecting-rod, which is stiff and made so as to be subject to as little torsion as possible. Cut that one element out and both are the old fashioned springs. So in my estimation, that is in each case, the whole virtue of the invention."

At page 49, in answer to the question: "Would it make any difference in the operation of the device as a means of equalizing the depression of the springs, whether the cross-connecting-bar was made as shown in defendant's Ex. "B" or complainant's Ex. "A", he says:

> "There is no difference at all in the principle of that. Whether it is as in complainants' Ex. "A" or as in defendants' Ex. "B" or even if it were connected at the lower end of these shackles in defendant's Ex. "B" the principle is exactly the

same, the object of it being simply to communicate the motion of one spring to the other, and it must work through the same rigid rod. The rod could be anywhere or it could be a series or a plate. It could be anywhere between the two extremes from the top of the shackle to the bottom."

Question :—"Would it change the principle of the operation?"

Answer :—"It would not be changed in the least."

And this position is adhered to by this witness throughout the entire direct and cross-examination.

In speaking of the Stringfellow device, at page 53, as before remarked, in answer to the request of counsel to state what he found in the patent describing the Stringfellow device to show any device for equalizing the motion of the springs, he answered :

"I find nothing, he evidently builded wiser than he knew."

This same witness was requested to make a test or experiment as to the comparative torsion of the connecting-rods of the Stringfellow patent and of Topliff & Ely's, or Augur's, and at pages 107 and 108, *et seq.*, he gives the result of that experiment, and states at page 108, that in practical use

"there would be very little difference between the connecting-rods in the two, but the stiffer of the two would be respondents' Ex. "B,"

for the reason that he above indicated. That reason was

"that both these connecting-rods, (speaking of Stringfellow's patent), running from this shackle down and joining to this point, are stiffer than if they came straight, and it really makes the rod here of only so much less length—in this instance five inches less length – on which there is a torsion, than in the other case, consequently it is even stiffer than the rod representing the respondent's model "A."

RESPONDENT'S MODEL "A" WAS THE TOPLIFF & ELY EX. "A."

Further on in the cross-examination, page 113, he says :

"There is greater ability in the Stringfellow rod to transmit power than in the Topliff & Ely rod."

And at page 114 the witness says, referring to respondent's Ex. "B" (Stringfellow's device):

> "I should say that on account of the increased rigidity at the forks, all the tendency—not for torsion, which would be the same in either case—but all the tendency for a direct bend of the shaft is eliminated and the shaft would communicate the motion just as well as if it was straight at either end of the shackle. That is due to the fact that it is shorter where the real torsion comes. It is shorter by the amount taken up by the forks and of course, the shorter any of these shafts, the less the torsion."

The testimony of the witness, C. G. Force, at page 120 of the record, a civil and mechanical engineer, was to the same effect. He says (at page 121):

> "That hanging defendant's Ex. "B" (Stringfellow's patent) in a position similar to that shown in Ex. "A" (Topliff & Ely's) that the two would give substantially the same result, and that if either rod would be required to be heavier it would be the rod of Ex. 'A.'"

Ludwig Herman, mechanical engineer of twenty-two years' practical experience (at page 56, *et seq.* of record), gives his opinion that the principle and operation of the two patents are the same. At page 58, he says that he

> "does not find any difference in the two producing the effect described. The half-elliptic springs in both cases are connected to each other by the use of links and transverse rods. The effect of these links and transverse rods will be that in case one of these springs is depressed by a load or otherwise, the motion of the end of that spring will, by means of these transverse rods and links, transmit it to the other spring and cause that other spring to be deflected in the same way and manner as the spring loaded."
>
> He says: "To make both exhibits, complainant's "A" and respondent's "B" identical, the supports, stands or clips in defendant's Ex. "B" would have to be straightened out, and the links, which in that case are united in the center, would have to be cut in two, and the transverse rod made straight," but that "such change *would not change the principle of their operation at all.*"

George Worden, a witness for the respondent, (page 63-64, *et seq.*) gives testimony equally as strong and to the same effect. He says (page 65):

> "That so far as an equalization of the pressure upon the springs is concerned, there is not any difference between the two rods as shown in the two models."

In answer to this testimony and its effect, the complainants introduced certain witnesses who testified that the functions of the two connecting-rods with their attachment were different.

Alexander F. Brown (at page 78) undertakes to draw a distinction or create a difference in the operation of the two devices from the fact, as stated by him, that the Stringfellow device "is wanting in the element of the shaft," which he finds in the Augur and in the Topliff & Ely devices, and that consequently "there is a difference in the function of the two devices." He says (page 79):

> "Whatever motion is communicated in Ex. "B" is communicated through a twisting of the shackle or this pin which would be a lateral bending of the spring at both ends of the shackle, and whatever motion is communicated from one spring to the other by means of this connecting-rod, is communicated by reason of the rigidity of the connection of the first named end of the rod with the shaft and pins and the stiffness of the rod itself. It is immaterial whether the connection at the opposite end is rigid or loose or simply has a bearing against it as far as communication of motion is concerned, whereas in Ex. "A" it is absolutely essential that the shaft and cranks form a rigid acting element."

This statement that it is immaterial whether the connection at the opposite end is rigid or loose or simply has a bearing against it, as far as communication of motion is concerned, cannot be true, and is shown not to be true by the great weight of the testimony in the case.

The cross-examination of this witness, at page 81, shows that he founds his opinion, that the two things are different, not upon different results or operations, but because they

operate through different elements. One operated as he says, through the element of *torsional strain*, the other operated through the elements of *bending strain*, as a beam.

Complainants' witness, John L. Finn, on cross-examination, page 87, in speaking of the tendency of the two rods to break, says that

> "the strain is more upon Ex. "B" because of the curvature of the beam or shaft, and that this tendency is only one of degree, that if you increase the size of the bar as shown in Ex. "B," you obtain the same result in kind and degree as in Ex. "A."

The testimony of G. H. Ely, complainant, shows that he acquired whatever mechanical education he possesses, before he went to college, and that he went to college at the age of sixteen. His opinion cannot therefore, be of much value. At page 92, in answer to the question whether he had examined the patent of Stringfellow & Surles, from which Ex. "B" was made, and if so to state where in the specifications or drawings there is any device shown, or claim for the equalization of the springs, he says:

> "I can find that there is nothing claimed. It may be possible to get a very imperfect equalization, but no mention of it is made in the patent anywhere or in the specifications or claim." He says, that "If any equalizing motion is conveyed from one spring to another, it is conveyed through what is called the tie braces, which are put in as a brace between these two C shaped jacks, which may equalize a little as a crank and not as a shaft. Mechanically speaking, the Stringfellow rod is a crank-pin or lever to the shaft; that the shaft transmits the power direct from one end of the rod to the other, and a crank-pin transmits it through the arm of the crank-pin to the shaft."

The vice of this testimony lies in the implication contained in it that that portion of the rod between the forks in the Stringfellow device does not act as a shaft through which power is transmitted from one end to the other. The statement confutes itself.

It is a grave mistake to suppose that the shaft may not be substituted for the crank-pin or the crank-pin for the shaft without infringement, if the one performs substantially the same function as the other. That this substitution may be made we understand is denied by appellees. A lever and a screw may be used interchangeably and still perform the same function in substantially the same way.

Walker on Patents, § 353.

Ferrell vs. *Spaeth*, 3 Bann. & Ard., 458.

The doctrine is clearly stated in *Imhaeuser* vs. *Buerk*, 101 U. S., pages 655-656, where the court say:

> "Equivalents may be claimed by a patentee of an invention consisting of a combination of old elements or ingredients, as well as of any other valid patented improvement, provided the arrangement of the parts composing the invention is new, and will produce a new and useful result. * * * * *
>
> "Such a patentee may doubtless invoke the doctrine of equivalents as against an infringer of the patent, but the term 'equivalent,' as applied to such an invention, is special in its signification, and somewhat different from what is meant when the term is applied to an invention consisting of a new device or an entirely new machine.
>
> "Pressure in a machine may be produced by a spring or by a weight, and where that is so, the one is a mechanical equivalent of the other. Cases arise also where a rod and an endless chain will produce the same effect in a machine; and where that is so, the constructor in operating under the patent, may substitute the one for the other, and claim the protection which the patent confers. Exactly the same function in certain cases may be accomplished by a lever or by a screw; and where that is so, the substitution of the one for the other cannot be regarded as invention.
>
> "Patentees of an invention consisting merely of a combination of old ingredients are entitled to equivalents, by which is meant that the patent in respect to each of the respective ingredients comprising the invention covers every other ingredient which, in the same arrangement of the parts, will perform the same function, if it was well known as a proper substitute for the one described in the specifications at the date of the patent. Hence it follows that party who merely substitutes another old ingredient for one of the ingredients of the patented combination is an infringer if the substitute performs the same function as the ingredient for which it is so substituted, and it appears that it was well known at the date of the patent that it was adaptable to that use."

A defendant has the same latitude in invoking the doctrine of equivalents as to anticipating devices, as the complainant has in establishing infringement.

The present case, even if the rod in the Augur patent is a shaft through which the force is transmitted from one side of the carriage to the other, and in the Stringfellow patent a crank-pin, is clearly within the doctrine of equivalents stated in the foregoing case. Both the shaft and the crank-pin were old and well known elements or parts of patented combinations, and performed the same function in the Augur and Stringfellow patents, as the testimony shows. (Pages record from 110 to 120) But the expert, Warner says, at page 112 of the record, in speaking of the connection in the Stringfellow patent. "We never should call any such thing a crank pin." It is an eccentric shaft. Both rods are shafts varying slightly in shape, but performing like or similar functions. "But, if the one is not the equivalent of the other we still claim the Augur combination not patentable.

All the witnesses for complainants agree that if the connecting-rod in the Stringfellow patent was made larger than the connecting-rod in the Augur patent or the Topliff & Ely patent, the same effect and operation would result.

Augur's combination or Topliff & Ely's, if an improvement on Stringfellow's was only what ordinary mechanical and engineering skill would readily have accomplished in view of the state of the art at the date of their respective alleged inventions. What they did, was no more than to make slight advances over what had preceded, which this court has repeatedly held was not invention.

Atlantic Works vs. *Brady*, 107 U. S., 199.

International Tooth Crown Co. vs. *Gaylord*, 140 U. S., 62.

McClain vs. *Ortmayer*, 141 U. S., 420.

Every element entering into their combination not embodied in the Stringfellow patent, was old. They certainly had no exclusive right to the springs; nor to the shaft or connecting-rod; nor to the links or arms; nor to the clips; nor to the bolster or axle. They had no exclusive right to the apparatus which resulted in securing rigidity to the connecting-rod. These were all well known instruments in mechanical use, and common to everybody. They had no right to the particular combination that enabled the transmission of power from one spring to the other, by means of the rigid connecting-rod. They had no right to the combination claimed, of a rod so connected to links or arms as to make the rod rigid, as all this was in the Stringfellow device. Something more than a mere combination of old elements is required in invention.

In *Pickering* vs. *McCullough*, 104 U. S. 310, the court, speaking through Mr. Justice Matthews, says, in relation to a combination for which new and useful results are claimed, that

> "the result must be a product of the combination, and not a mere aggregate of several results, each the complete product of one of the combined elements.
>
> "Combination results are not necessary to a novel result, nor are they an old result obtained in a new and improved manner; merely bringing old devices into juxtaposition and there allowing each to work out its own effect without the production of something novel, is not invention."

In the head-note of the case it is said:

> "A combination of old elements is not patentable, unless they all so enter into it as that each qualifies every other. It must either form a new machine *of distinct character and function*, or

> produce a result which is not the mere aggregate of separate contributions, but is due to the joint and co-operating action of all the elements."

See to the same effect *Adams* vs. *Bellaire*, 141 U. S., 542.

The Stringfellow patent had the joint and co-operating action of all the elements, the rigid rod, the clip connection, attachment to the springs and to the bolster and axle, and accomplished the result of equalizing the springs when the weight rested on one; and he claimed the transverse rod (rigid rod) "arranged and operated for the purposes specified." Here was the complete combination embraced in the Augur patent. The failure to embrace equalization of weight upon the springs, either in his description or in his claim did not authorize Augur or Topliff & Ely to appropriate such effect and claim to be its discoverers. By a failure to claim it he abandoned it to the public.

Miller vs. *Brass Co.*, 104 U. S., 350.

Mahn vs. *Harwood*, 112 U. S., 363.

White vs. *Dunbar*, 119 U. S., 47.

The patent of A. C. Stowe, No. 84,316, of November 24th, 1861, (record page 72) sought the accomplishment of the equalization and movement of the springs in unison, by similar means, as appears from page 72 of the record. He says:

> "The object of my invention is to so connect the two side springs of a carriage that the weight placed on any portion of the carriage will depress each side equally, and prevent the strain to the spring's action by the frequent wrenching they are subjected to in getting in or out of the carriage."

While the specifications of this patent differ from those of the Augur or Topliff & Ely, and the Stringfellow, the invention aids us in determining the state of the art at the

time that Augur made his application for his patent, and bears with much force on the question whether the seeming difference between the Stringfellow device and Augur's was patentable.

Suppose it to be true, as some of the complainant's witnesses stated, that to make the Stringfellow rod as efficient as the Augur in its capacity to trasmit power, it is required to make it so large as to be somewhat cumbersome, is the discovery of the better result wrought by the change from the Stringfellow rod to the Augur patentable? Is this change one for which Stringfellow and the public must so far recompense the inventor as to yield to him the exclusive right to make, use and vend the article for the period of seventeen years? Most manifestly not. It would be parting with something of great value for a meager equivalent.

The contention of opposing counsel comes to this: By changing the shape of the Stringfellow rod it is made more effective, and the conception or mental operation that discovered the efficiency of this change amounts to invention within the statutory meaning of that term. This contention overlooks the fact that the change must be of a nature to show that it would not have been suggested by ordinary mechanical skill in view of the then state of the art.

The witnesses who testify that there is a difference in the power of the two rods to transmit motion, all agree that this difference results from the bending of the rod in the Stringfellow patent, and that this difference is easily ascertainable by mathematical calculation.

Put the straight rod into the Stringfellow connections and we have the complete Augur device.

If the Stringfellow device was made of sufficient strength to perform exactly the same function and secure the same effect as the Augur, or the Topliff & Ely device, would it be claimed that straightening the rod and diminishing the size, would be an infringement of the Augur or the Topliff & Ely patent? Such a claim would be manifestly absurd.

Test the question another way: suppose, that the Stringfellow device be made of sufficient strength to transmit the motion of one spring to the other, and that some one accomplished the same thing by substituting the straight rod with diminished size, would that change amount to invention? This would be the most which by any possibility could be claimed by Augur for the effect of his invention.

It, however, is not true that a bending of the rod within the limits shown by the device Ex. "B" (Stringfellow's) weakens it in any degree whatever. This was demonstrated by the experiment made by the witness Warner, upon the model, as testified to by him (page 107 and 108). A similar device was constructed by him for the purpose of testing the strength of the two rods. He made the experiment carefully and accurately, and demonstrated that there was no practical difference between the two rods. The experiment was witnessed by the witness Force, an educated mechanical engineer, who fully corroborated Warner as respects the practical working strength and use of the two rods; both witnesses concurring in the fact that the difference in the shape of the two rods does not weaken the power of the Stringfellow rod of ordinary size to transmit the requisite motion to secure an equalization of the action of the springs where the load is over one.

But it is said that where the result is produced by different mechanical means, there necessarily results a different device; that is, if you take two rods of the same size, the one straight, the other bent, and produce with each the same result, you have two inventions, because their functions are different. The fact that they produce the same result shows similarity of function.

Let us suppose the straight rod to have been first used, and patented, would not the use of a bent rod producing the same result in the same way, infringe the patent? Certainly so. Such change in the shape of the connecting-rod would not be invention, though one is called a shaft and the other a crank-pin. It is therefore clear that these two devices perform the same function, and thereby produce the same result, and in substantially the same way. The bent rod, within the limits required, is a substitution for or an equivalent of the straight rod, and the substitution of an equivalent is not invention.

Blake vs. *Robertson*, 94 U. S., 732.

Imhaeuser vs. *Buerk*, *supra*.

Smith vs. *Nichols*, *infra*.

Walker on Patents, § 36.

Moreover if not an exact equivalent, the difference in the efficiency of the two devices certainly is not so great that it would not have been readily discovered and applied by an intelligent mechanic whose mind was directed to the subject.

In *Smith* vs. *Nichols*, 21 Wall., 112, the court say:

> "A mere carrying forward of an original conception patented—a new or more extended application of it—involving change only

> of form, proportions or degree—the substitution of equivalents doing the same thing as did the original invention, by substantially the same means with better effects—is not such invention as will sustain a patent. It is the invention of what is new and not the arrival at comparative superiority or greater excellence in that which was already known, which the law protects as exclusive property and which it secures by patent."

This is the language of this court in the above case, repeatedly re-affirmed by the subsequent adjudications of the court.

Penn. Railroad vs. *Locomotive Truck Co.*, 110 U. S., 494.

A change in proportion or form or shape, is not a change patentable within the meaning of the statute.

Merwin, page 83, *Hotchkiss* vs. *Greenwood*, 11 Howard, 248–266.

Hicks vs. *Kelsey*, 18 Wall., 670–674.

It is not invention to increase the degree of efficiency of a device, or of one feature of a device. Walker, paragraph 31, and cases cited there.

Guidet vs. *Brooklyn*, 105 U. S., 552.

Viewed in any light, and as respects both questions, we respectfully submit that it clearly appears that the device of Augur was anticipated by the device of Stringfellow; and secondly, that the difference in the devices, if we are wrong in our first proposition, is not patentable; so that the respondent in manufacturing the article in accordance with the specifications of the Topliff & Ely patent, anticipated by both Augur and Stringfellow, was not in the least accountable to the complainants therefor.

We further respectfully submit, although the question relates to the one next discussed, that the complainants can-

not maintain an action on the Augur patent to recover more than the amount for which it was pledged; namely, $2,000 and the interest thereon, from the time Augur pledged it to Atwater.

The complainants succeeded merely to the ownership of the debt and the assignment of the patent as security for its payment. Seeking to recover more than the debt for which the patent was pledged, Augur was a necessary party, having a direct and legal interest in the patent, and the right to its re-assignment to him upon the payment of the debt, to secure which, it was assigned to Atwater. When that debt was paid, either by receiving royalties upon the patent or by recovering damages for its infringement, Augur was entitled to a re-assignment, and would then be the owner without such re-assignment of the entire interest therein. Such being his relation to the patent, he was a necessary party.

Jordan vs. *Dobson*, 4 Fisher Patent Cases, 232–236.

Telghman vs. *Proctor*, 125 U. S., 143.

Topliff & Ely in no sense represent his interest and a recovery by them would not bar an action by Augur to recover damages for the injury to his resulting interest in the patent by any infringement thereof.

IV.

DAMAGES CLEARLY ERRONEOUS.

There is not a possible doubt that the master erred in his measure of damages, and the court in confirming the report.

We assume that the Augur patent, if held to be valid, anticipated the Topliff and Ely patent and reissue, and rendered the latter void.

The complainants purchased the Augur patent April 9th, 1884. Before that date they had no interest therein. Their bill was filed June 9th of the same year, two months after they acquired title to the patent.

The bill did not make the assignment of the claim for damages for prior infringements of the Augur patent a basis or ground of recovery, and asked no recovery therefor. If it had, no evidence was offered in relation thereto; hence for infringing the Augur patent, the complainants were only entitled to recover such damages as they sustained by reason thereof after they became its owner at the date aforesaid.

Secondly: If they were entitled to recover all the damages that Atwater sustained by reason of the infringement of the Augur patent prior to April 9th, 1883, the date of the assignment to Saladee, (record pages 19-20) and the damages Saladee sustained for the year from April 9th, 1883, to April 9th, 1884, the date of the assignment to the complainants; or, had the action been prosecuted therefor, the rule adopted by the master to ascertain the amount was grossly erroneous. He acted on the erroneous assumption that the complainants owned the Augur patent from 1880 down to the time of the trial, ascertained how many sets of equalizers the respondent made during the years 1882, 1883, 1884, 1885, and 1886, to the time of the trial, and gave the complainants damages on the assumption and basis that they, and not Atwater nor Saladee, would have supplied such trade during all those years, although they had no right to make or sell a set of equalizers under the Augur patent until April 9th, 1884; and the amount was greatly enlarged by the fact found that the complainant had the plant and necessary machinery to make the additional

number of equalizers that the respondents made, with, and by a supply only, of an additional force of men.

The testimony (see record pages 154–174) was wholly confined to the extent of the complainants' trade during the years 1882, 1883, 1884, 1885 and 1886, what it cost them to make a carriage set of equalizers, what the price at which the complainants sold was, how many the respondent made and sold, and what portion or part of that number the complainants would have supplied during those years had the respondent been out of the trade.

It contains nothing as to Atwater's loss prior to April 9th, 1883, nor of the number he would have supplied, nor of Saladee's loss from that date to April 9th, 1884, during which period the complainants had no right of recovery except upon assigned claims on which they did not seek a recovery, and to which the testimony did not in the least particular relate.

A table or exhibit on page 154 of the record was put in evidence to show the falling off of the complainants' trade from the year 1882 to 1886, alleged to have resulted from the respondent's manufacture and sale; and the master in his first report (record page 152), expressly finds after conceding that the finding is "necessarily speculative:" "that up to January, 1884, the defendant sold 7,550 sets of equalizers of ½ inch steel. Of this number, I find that complainants would have sold 5,660 had defendant not been a competitor in the market. The proof shows that the complainants, during that period, sold their equalizers at a profit of 92.3 cents. Their damage on 5,660 equalizers made and sold by defendant would have been $5,224.17. After January 1st, 1884, defendant made and sold, on the same basis of calculation, 1,642 sets of equalizers

of ½ inch steel, which complainants would have sold had the defendant not been in the market, and upon which the complainants are entitled to recover their profit which would have been 67¼ cents per set, or $1,104.24."

He then found "from February 11th, 1884, to April 28th, 1885, defendants sold 3,100 equalizers made of rods ⅝ inch and larger, and that complainants' profits on what they would have sold of that number, had the defendant not been a competitor, would have amounted to $1,563.56. Of ½ inch rods during that period 1,451 sets were made, 1,000 of which complainants' would have made, and that their profits thereon would have been $698.00."

It will thus be seen that $5,224.17 entered into the amount of damages assessed for the alleged infringement of the Augur patent prior to 1884, founded wholly on the assumption that complainants were, during such period, its owners, and besides that, an additional sum for those manufactured and sold by respondent in 1884 prior to April 9th, which went in to the total for that year.

While this report of the master was set aside, the number of equalizers manufactured and sold by respondent for those years, so found, was not in the least changed or affected, as the report was set aside and the case was re-referred for the sole purpose of enabling the master to hear proof and to deduct from his estimate of damages a manufacturer's profit, which had been omitted in the first finding. (See record page 236, *et seq.*) That the same error entered bodily into the final report, is shown from its language, page 208. We quote: "Exhibits two and three and schedule, show as set forth in my former report, that the defendants sold the fol-

lowing number of sets of rods and sizes, viz., 9,952 sets of steel rods ½ inch, 5,005 sets of rods ⅝ inch and larger, 611 sets of rods of "Stringfellow form" ⅝ inch. 1,034 sets reported October, 1887, by defendant as made since his former return to court, ⅝ inch. 16,602 total sets. These sales were all made in *a part of 1882, 1883, 1884 and fore part of 1885*, except the sale made under leave of the court after the decree and injunction."

He further found that the complainants' sales "had decreased from 9,900 in 1881, the year before the defendant began his infringement, to 5,343 in 1884, when defendant was in full competition. The defendant's sales in the three years aggregated within a small number, of 15,000, or within a fraction of 5,000 per year; so that in the year 1884 defendants' sales were only about ten per cent. less than complainants', and complainants' decreased sales from 1881 were about equal to defendant's entire sales."

He then found that of the 16,602 sets sold by defendants during those years, the complainants would have sold eighty per cent. or 13,282 had the defendant not been an infringer, and makes their total loss, by reason of the infringement on that number of sales, $725.86. By this it appears that the greater part of the damages awarded related to complainants' loss by reason of the alleged infringement from the year 1881 to the year 1884, during all of which time the Augur patent was owned by others.

The master also added $754.65 damages for loss resulting from the fact as found that by reason of respondent's sales in 1882 and 1883, the plaintiffs were compelled, January 1st, 1884, over three months before they owned the Augur patent,

to reduce the price from $1.12½ to 90 cents per set for equalizers, by reason of respondent's competition, they selling 3,354 sets at the reduction so enforced. Their loss therefor estimated at the above sum was allowed as damages.

It will appear from the complainants' testimony, that the question of damages, (see record pages 74–75 *et seq.*) was wholly confined, as we have before stated, to the ascertainment of what complainants could have furnished the equalizers for, made and sold in those years by respondent, with their means and conveniences for manufacturing, and their ability to purchase iron in Norway expressly rolled for them, at a reasonably small figure.

Complainant Ely's testimony at pages 174–175 of the record, clearly shows upon what the master acted. He says (at page 174) that they "could have made 50,000 sets a year without any addition to their machinery or their appliances, simply by employing additional men." And in answer (on page 175) to the question "to give the master a statement in detail of the cost of making equalizers such as were shown in the testimony in the case," he says: "In getting very accurately at the cost, the price would depend somewhat upon the length of the rods, making a difference in the material used."

"Mr. Topliff in his testimony the other day, gave thirty inches as an average length. Our experience is, that it is much less than that. We make them down to 22 inches, and it is only in rare instances we make them as long as thirty inches, but in this estimate of cost I have taken what he gave as an average length, namely, thirty inches. There would be two pieces of iron thirty inches long. First, let me say I

have given prices of two kinds here, 5/8 iron and 1/2 inch steel. That covers nearly all that is manufactured. Some 3/4 are made, but those we sell for more, and the profit on those is greater than on these, because we get more than the additional cost. We never have made anything but 5/8 wrought iron and half inch steel. Two pieces of thirty inch iron would be five feet of 5/8 iron, which weighs 1.02 pounds per foot. Five feet would weigh 5.1 pounds. At $1.90 this world be $9.69. That iron I put in at $1.90 a hundred. That was the price we paid for that at the time, delivered in Elyria. It takes two of these rods for a set, one at each end of the buggy, and there are eight links.

The iron for those links weighs thirty and one-half ounces, that is, the iron as it is in the bar. The iron that it takes to cut those eight links out in a bar, would weigh 30 and 1/2 ounces, or 1.90625 pounds. That at three and three-eighths cents a pound would be 6.43359 cents. That is all the material except the coal. The work we do altogether by the piece, except cutting these links out upon a press. That press works continuously and cuts them right out, and it costs us less than a half-cent to cut those out. A man will cut thousands of them in a day. I have put them in at half a cent a set. The price we pay for making them is 5 1/2 cents a set. It takes two and one-half pounds of coal to make a set, which, at $5 a ton, would be .625 of a cent, making the total cost 22 3/4, or, in a decimal, 22.748 cents a set. I have on this statement the price in detail of making the half-inch steel rods, showing the total cost of the steel ones to be 20.197 cents per set. In this I have added nothing for office expenses, cost of selling, etc."

Thus it will be seen that the loss to complainants in taking from them what was alleged to belong to their manufacture,

entirely governed the amount of the recovery. No loss to Atwater; nor to Saladee; no royalty established by them for the right to manufacture and sell under the Augur patent, no effect upon or injury to their sales or trade while owning the patent, was considered or even mentioned at the trial; circumstances which of necessity show that the measure of damages was an erroneous one.

Moreover, the damages awarded the complainants for an infringement of their own patent, were clearly wrong within the rule of *Garretson* vs. *Clark*, 111 U. S., 120, and *Black* vs. *Thorne*, *ibid*, 122.

If the complainants' patent can be sustained as against Augur's it must be because of the additional attachment of the springs to the forepart of the carriage, for in no other particular does it differ from the Augur patent. Hence, the complainants could only recover for an infringement of their device such damages as they sustained through the infringement of the particular feature of their patent which constituted the difference between it and the Augur device. This court has repeatedly so decided.

The head-note in the Garretson case is as follows:

"When a patent is for an improvement of an existing machine or contrivance, the patentee in a suit for damages for infringement, must either show by reliable, tangible proof that the value of the machine or contrivance as a whole, is due to the use of his patented invention, or he must separate and apportion by proof of the same character, the part of the defendant's profits which are derivable from the use of it, in order to establish a claim for more than nominal damages."